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CANADA
DEPARTMENT OF MINES
MINES BRANCH
HON. W. TEMPLEMAN, MINISTER; A. P. LOW, LL.D., DEPUTY MINISTER;
EUGENE HAANEL, PH.D., DIRECTOR.

AN

INVESTIGATION

OF THE

COALS OF CANADA

WITH REFERENCE TO THEIR ECONOMIC QUALITIES:

AS CONDUCTED AT McGILL UNIVERSITY, MONTREAL,
UNDER THE AUTHORITY OF THE DOMINION
GOVERNMENT

IN SIX VOLUMES

BY

J. B. PORTER, E.M., D.Sc.

AND

R. J. DURLEY, Ma.E.

ASSISTED BY

THÉOPHILE C. DENIS, B.Sc., EDGAR STANSFIELD, M.Sc.,
AND A STAFF OF SPECIAL ASSISTANTS.

VOL. III

OTTAWA
GOVERNMENT PRINTING BUREAU
1912

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No [illegible]

THE
COALS OF CANADA:
AN ECONOMIC INVESTIGATION

VOL. III

APPENDIX I

DETAILED RESULTS
OF THE
COAL WASHING TRIALS

BY

J. B. PORTER

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[1] This list contains only the samples which were included in the coal washing investigation. A complete list of all samples taken is given in Vol. I, p. 8, and Vol. II, p. 181.

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ERRATUM

On the curve diagrams accompanying the tabulated records of each of the coals tested, is the following legend:—

LEGEND: SYMBOLS

○ Curve showing the relative quantities of the several sizes.
△ " " " " " " " densities.
□ " " " percentage of ash in each of the several sizes.
◉ " " " " " " material floating at the several densities.

The above legend is incorrect: in each case it should read thus:—

○ Curve showing the relative quantities of the several sizes.
□ " " " percentage of ash in each of the several sizes.
◉ " " " " " material floating at the several densities.
△ " " " " " ash in " " " " " "

DETAILED RESULTS
OF
COAL WASHING TRIALS
BY
J. B. PORTER.

INTRODUCTORY.

In the autumn of 1906, the Canadian Government, through Dr. A. P. Low, Director of the Geological Survey, decided to undertake a study of the fuels of the Dominion, somewhat on the lines of the fuel tests which had already been commenced by the United States Geological Survey. But inasmuch as the Government had not, at Ottawa, any suitable mechanical laboratories, and as research work had already been done by the Mining Department of McGill University on a number of western coals, Dr. Low invited Dr. Porter, the head of that department, to undertake the larger investigation. This proposal was approved by the University governors, and Dr. Porter was authorized to carry out the tests in the University laboratories, without charge; on the understanding that the Government would pay for such apparatus as might be required to supplement the existing equipment, and to make good all additions to the salaries, wages, and supplies accounts rendered necessary by the investigation. At the request of Dr. Low, also, the Intercolonial and Canadian Pacific railways very generously agreed to haul the material—amounting to many hundreds of tons—free of charge.

Shortly after the commencement of the investigation the Dominion Department of Mines was created, under the Hon. William Templeman, as Minister of Mines, and Dr. A. P. Low, as Deputy Minister; and the investigation, together with all matters relating to economic minerals, was transferred from the Geological Survey to the Mines Branch, under the Directorship of Dr. Eugene Haanel. The original arrangement was, however, in all other respects, continued without change.

From the beginning it was intended to confine the investigation to the coals and lignites of the Dominion; and the following points were covered by the scheme:—

Sec. I.—General organization and administration.
II.—Preparation of a general summary report on Canada's coal fields and coal m.
III.—Sampling in the fiel
IV.—Crushing the samples and preparing them for treatment.
V.—Washing and mechanical purification.
VI.—Coking trials.
VII.—Steam boiler trials.
VIII.—Producer, and gas engine trials.
IX.—Chemical laboratory work, and miscellaneous investigations.

TECHNICAL STAFF.

The technical staff engaged in the investigation, comprised:—

(1). J. B. Porter, E.M., Ph.D., D.Sc., Professor of Mining Engineering, McGill University—Responsible for the organization and general directions of the investigation, and directly in charge of Sections I, IV, and V, and VI (in part).

(2). R. J. Durley, B.Sc., Ma.E., Professor of Mechanical Engineering, McGill University—in charge of Sections VII and VIII.

(3). Theo. C. Denis, B.Sc., Mines Branch, Department of Mines, Ottawa—In charge of Sections II and III (in part).

(4). Edgar Stansfield, M.Sc., Chief Chemist—In charge of Section IX, and Sections III and VI (in part).

(5). H. F. Strangways, M.Sc., Dawson Fellow in Mining, McGill University—Assistant in Sections IV and V, 1907.

(6). H. G. Carmichael, M.Sc., Dawson Fellow in Mining, McGill University—Assistant in Sections IV and V, 1908.

(7). E. B. Rider, B.Sc., Demonstrator in Mining, McGill University—Assistant in Sections IV and V, 1909-10.

(8). Chas. Landry, Chief Mechanic of Mining Department, McGill University—Foreman in Sections IV and V.

(9). J. W. Hayward, M.Sc., Assistant Professor of Mechanical Engineering, McGill University—Assistant in charge of Section VII, 1907, and preliminary work in Section VIII.

(10). J. Blizard, B.Sc., Lecturer on Mechanical Engineering, McGill University—Assistant in charge of Section VII 1908, and Assistant in Section VIII.

(11). D. W. Munn, M.A. B.Sc., Demonstrator in Mechanical Engineering, McGill University —Assistant in Sections VII and VIII.

(12). G. L. Guillet, M.Sc., Demonstrator in Mechanical Engineering, McGill University—Assistant in Section VII.

(13). G. Killam, M.A., B.Sc., Demonstrator in Mechanical Engineering, McGill University—Assistant in Section VIII.

(14.) J. S. Cameron, B.Sc., Demonstrator in Mechanical Engineering, McGill University—Assistant in Section VIII.

(15). A. Balmfirth, Superintendent of McGill University Power House—Foreman in Section VII.

(16). J. Gardner, Foreman in Section VIII.

(17). J. Hoult, Fireman in all tests of Section VII.

(18). J. H. H. Nicolls, B.Sc., Assistant Chemist—Assistant in Section IX 1908, 1909.

(19). R. T. Mohan, B.Sc., Assistant Chemist—Assistant in Section IX 1908.

(20). P. H. Elliott, M.Sc., Assistant Chemist—Assistant in Section IX 1908.

(21). E. J. Conway, B.Sc., Assistant Chemist—Assistant in Section IX 1908

(22). W. B. Campbell, Assistant Chemist—Assistant in Section IX 1909.

(23). R. S. Boehner, M.Sc., Demonstrator in Chemistry, McGill University—Assistant in Section IX 1908, 1909.

(24). H. Hartley, B.Sc., Assistant Chemist—Assistant in Section IX 1909.

(25). W. P. Meldrum, B.Sc., of the Department of Chemistry, McGill University—Assistant in Section VI 1909.

(26). H. H. Gray, B.Sc., Demonstrator in Metallurgy, McGill University—Assistant in Section VI 1909.

(27). H. G. Morrison, B.Sc., Assistant Chemist—Assistant in Section IX 1909, 1910.

There were also a number of machinists, mechanics, and labourers engaged more or less continuously in the several sections.

In addition to the persons above named, the following members of the University staff very materially aided in the progress of the work by giving occasional assistance and advice:—

Alfred Stansfield, D.Sc., Professor of Metallurgy.

H. T. Barnes, D.Sc., Professor of Physics.

Acknowledgment is also due to the Governors of McGill University, and to W. Peterson, C.M.G., Principal; F. D. Adams, F.R.S., Dean; W. Vaughan, Esq., Secretary; S. R. Burrell, Esq., Chief Accountant, and many others.

LABORATORIES.

The laboratories of the Mining and Mechanical Departments of McGill University, in which the tests were made, were built and equipped some few years ago on a scale unequalled at the time in North America, the buildings and apparatus for the Ore Dressing Department alone costing over $150,000, and the Steam Laboratory an almost equal sum. This equipment needed very little augmentation in respect of sampling, crushing, coal washing, steam boiler tests, and chemical analysis; although a number of minor pieces of appartus had to be purchased, such as extra calorimeters, pyrometers, thermometers, etc., etc.

In the matter of producer and gas engine tests, larger expenditure was necessary, as the University equipment was on too small a scale for the extensive tests contemplated. An addition 25 × 70 was, therefore, built to the Ore Dressing Laboratory, and equipped with a complete plant of the most modern type, the cost for building and plant being approximately $12,000. A detailed description of this plant, with cuts of the apparatus, etc., will be found in Vol. II, Part VIII, of the report, and similar descriptions of the apparatus used in the other parts of the investigation will be found in the other parts.

THE INVESTIGATION.

Sampling in the field.

Sixty-three separate mines of seams were specially sampled for the investigation. The work of sampling was always done by a responsible member of the technical staff and every precaution was taken to ensure reliability. The general rules governing this sampling, and the detailed descriptions of the work of sampling at the several mines are fully stated in Vol. I, Part III.

A list of the samples arranged in geographical order is given in the table of contents of each volume of the appendices III, IV, V, and VI, and is also printed in the text of the report proper, Vol. I, pp. 8 to 11, and Vol. II, pp. 181 to 184.

Crushing and Sampling in the Laboratory.

The main samples on their arrival at the testing plant at McGill University were all crushed to go through a 2″ screen, mixed thoroughly on a large granolithic sampling floor, sampled for the chemist, etc., and finally resacked, sealed, and sent to a dry room for storage while awaiting test.

The methods of sampling are stated in detail in Vol. I, Part IV.

The smaller subsidiary samples were sent directly to the chemical laboratory, where they were stored in sealed vessels until required.

Mechanical Purification.

Each main sample was experimentally treated in the laboratory with heavy solutions, and the fractions analysed with a view to determining the probable results of washing. In all cases where these preliminary tests gave favourable results, a large lot was treated in the coal washing plant of the University, which includes a specially designed experimental two compartment slide motion jig, a Robinson washer, and much secondary apparatus. This jig had been specially remodelled for coal washing work, and is provided with adjustable feed and side discharge devices for automatically removing the slate and other impurities. The purified coal overflows into a drainage box, in which it is collected and dried. The fine material passing down through the sieves is collected, and is either re-treated or wasted, depending upon its composition. Each of the tests was made on a lot of between three and four tons; which was first crushed, then sized, and then jigged in three separate portions—coarse, intermediate, and small—in order to achieve the most accurate results. The very fine coal was also treated when the coal was suitable for coking, or when, for any reason, there was likely to be a commercial justification for saving the fines. The products both of coal and waste were all recovered, weighed, and sampled; but the coarse and fine products were mixed before sending them to the boilers.

The coal washing work was checked by a further series of tests with heavy solutions. It would, of course, be possible in a laboratory to do extremely thorough washing at an expense disproportionate to the value of the coal; but this was not attempted, the aim being to reproduce commercial conditions. From comparative tests made between laboratory work, and coal washing in standard plants, it is evident that this end was attained, and the tests as carried on may be taken in a broad way to represent average commercial work.

The whole subject of coal washing as well as testing is dealt with in Vol. I, Part V, and the results of all of the trials are presented in a series of summary tables. The detailed results of each test are given in the present volume and are followed by the summary tables reprinted from Volume I.

Coking Trials.

Coke, as ordinarily manufactured in beehive ovens, can only be produced from bituminous coals possessing particular qualities, but when retort ovens are employed a larger range of coals are available, although even at best there are many coals from which good coke cannot be produced.

Several series of trials were made to test the coking qualities of the various coals in both types of ovens, and also to determine upon a reliable method of producing coke from small quantities of coal, and a method of comparing different cokes in respect of their strength, porosity, etc.

These experiments are described in detail and their results summarized in Vol. I, Part VI, but additional matter relating to special methods of testing, etc., will be found in Vol. VI, Appendix IV.

Boiler Trials.

The boiler trials were conducted in the boiler testing room of the University, the method used being as far as possible in accordance with standard practice.

The boiler, which is a Babcock and Wilcox, rated at 60 H.P., was thoroughly cleaned and tested before the trials were commenced, and standardizing tests were run with Georges Creek coal. The series included 72 trials, each of which lasted at least ten hours.

The methods employed in conducting the trials are fully detailed in Vol. II, Part VII, and this Part also contains a general discussion of the use of coal for steam raising, and a tabular summary of the whole series of trials.

Full notes of each of these trials are published in Vol. IV, Appendix II, followed by the summary record above referred to reprinted from Vol. II.

Producer Trials.

The producer trials were made in a special laboratory erected and equipped for the purpose at McGill University. Several producers were tested, but the standard trials were carried out in a special down-draught producer rated at 40 H.P.

The trials lasted at least 24 hours, and were checked by longer runs—one of 10 days.

The methods employed in conducting the trials are fully set forth in Vol. II, Part VIII, and a summary of the results of the trials is presented in tabular form. This Part also contains a discussion of general questions of the use of producers and gas engines for the generation of power. The detailed results of the trials are contained in Vol. V, Appendix III.

Chemical Work.

The chemical laboratory of the Mining Department at McGill University was given over exclusively to the work of the tests for more than three years. Standard methods of analysis were used as far as possible, and these, together with a number of important special methods, are fully described in Vol. II, Part IX. A summary statement of the analyses of all of the regular samples appears at the end of the same part. Details of the less important analytic work, and accounts and records of a large amount of secondary work, are given in Vol. VI, Appendix V.

THE REPORT.

It will be seen from the above description of the investigation, that an attempt has been made to cover a large field, and yet to do the work in great detail. As a result of this, a very large amount of information has been gathered; but much of it is so highly technical as to be only of interest to specialists, hence it has been thought best to divide the Report—which comprises six volumes—into two main sections: of two and four volumes respectively.

In the first section there are separate chapters, or parts, dealing with each of the seven divisions of the investigation outlined in the last few pages. Each of these parts begins with an introduction in which the subject of the division is dealt with in a general way, followed by a more or less extended description and discussion of the experimental work attempted; and concluding with a carefully tabulated summary of all of the tests in that division.

Preceding the technical reports referred to above there are two important chapters, the first being an introduction dealing with the investigation a whole, and the second being a very full descriptive paper on the history, geology, and present commercial development of the coal fields and coal mines of Canada, from the pen of Mr. Theo. C. Denis—

a member of the permanent staff of the Mines Branch of the Department of Mines. This part of the Report, which is profusely illustrated with maps and photographs, differs from the remainder in that its matter is largely drawn from previous publications of the Geological Survey and other sources, but it possesses great value as an introduction to the somewhat technical reports which follow, and is of importance, on its own account, as the most complete single work yet written on the coal fields of the Dominion.

The first two volumes of the Report, comprising Parts I to IX inclusive, may, therefore, be considered as complete in themselves, and it is hoped that they will prove of value not only as contributions to the technological literature on coal, but also as a source of useful and timely information to the general public, on the coal resources of the Dominion and on the best methods of utilizing these resources.

The remaining four volumes, III, IV, V, and VI, are given up exclusively to tabulated records and details of the tests summarized in Volumes I and II, to which they thus become highly technical appendices.

DETAILED RECORDS OF THE WASHING TRIALS, ARRANGED IN THE ORDER OF THE GEOGRAPHICAL OCCURRENCE OF THE SAMPLES.

SYDNEY COAL FIELD.

CAPE BRETON CO., NOVA SCOTIA.

ERRATUM

On the curve diagrams accompanying the tabulated records of each of the coals tested, is the following legend:—

LEGEND: SYMBOLS

○ Curve showing the relative quantities of the several sizes.
△ " " " " " " " " densities.
□ " " " percentage of ash in each of the several sizes
◉ " " " " " " material floating at the several densities.

The above legend is incorrect; in each case it should read thus:—

○ Curve showing the relative quantities of the several sizes.
□ " " " percentage of ash in each of the several sizes
◉ " " " " " material floating at the several densities.
△ " " " " " ash in " " " " " "

COAL.--No. 50.

Locality.—Port Morien, Cape Breton, N.S.

Colliery.—North Atlantic collieries.

Sample.—This mine was closed at the time the car load samples were taken, but was opened later and a sample of 200 pounds was then taken by Mr. Stansfield, the coal being from the Gowrie seam. The sample was taken after the coal had been cleaned over a ¾″ wire shaking screen and had been hand picked. The Blockhouse seam was not then being mined.

TABLE A.

Specific Gravity Tests.

	Specific gravity of solution.	Float %	Ash in Float %	Sink %	Ash in Sink %
1.	1·550.............	82·8	5·5	17·2	45·0
2.	1·426.............	71·6	4·3	28·4	35·1
3.	1·375.............	62·8	3·4	37·2	28·7
4.	1·330.............	47·7	2·5	52·3	23·8

The following results are obtained from the above data, and the chemists reports:—

5.	Good coal, Sp. Gr. under 1·375	% yield	62·8	% ash	3·4
6.	Bone coal, Sp. Gr. 1·375 to 1·55....................	“ “	20·0	“ “	12·1
7.	Useful coal—sum of (5) and (6).....................	“ “	82·8	“ “	5·5
8.	Refuse, Sp. Gr. over 1·55	“ “	17·2	“ “	48·6
9.	Assay of original sample raw coal as sent to chemist..............			“ “	12·3
10.	“ “ “ “ “ “			% sulphur	6·4
11.	“ “ “ “ “ “			Fuel Ratio	1·53
12.	Assay of mixed good and bone coal (5) and (6)..................			“ “	.

Remarks.—The coal has a moderate amount of innate ash and a fairly large amount of bone somewhat high in ash. The refuse is considerable in amount, with a medium proportion in ash. The coal would be considerably improved by washing, but owing to the delay in taking the sample and the small quantity obtained no tests were made other than those with the heavy solutions above summarized.

TABLE B.

Screen Analysis.

	Maximum Screen MM.	Minimum Screen MM.	Mean MM.	% of whole sample.	% Ash in size.
13.	....	....	....	....	....
14.	...	...	..	...	....
15	....	....	....	....	....
16.	....	....	....	....	....
17.	...	..	...	...	...
18.	.	....	....		..

TABLE C.

Results of Washing (Details of Sizes).

	Original coal and its products.	Sizes between 1" and ½" Total wt. lbs.	Ash. %	Sizes between ½" and ¼" Total wt. lbs.	Ash. %	Sizes under ¼" Total wt. lbs.	Ash. %
19.	Original coal	This coal was not washed.					
20.	Washed coal						
21.	Refuse—coarse						
22.	Hutch product						
23.	Jig slimes						
24.	Table slimes						

TABLE D.

Results of Washing (Totals).

25.	Original coal	wt. in lbs.	..	% ash	....	% sulphur	....
26.	Washed coal	" "	....	" "	....	" "	....
27.	Refuse	" "	...	" "	...	" "	....
28.	Other products	" "	....	" "	....	" "	....
29.	Loss	" "	....	" "	....	" "	....
30.	Loss in %						

TABLE E.

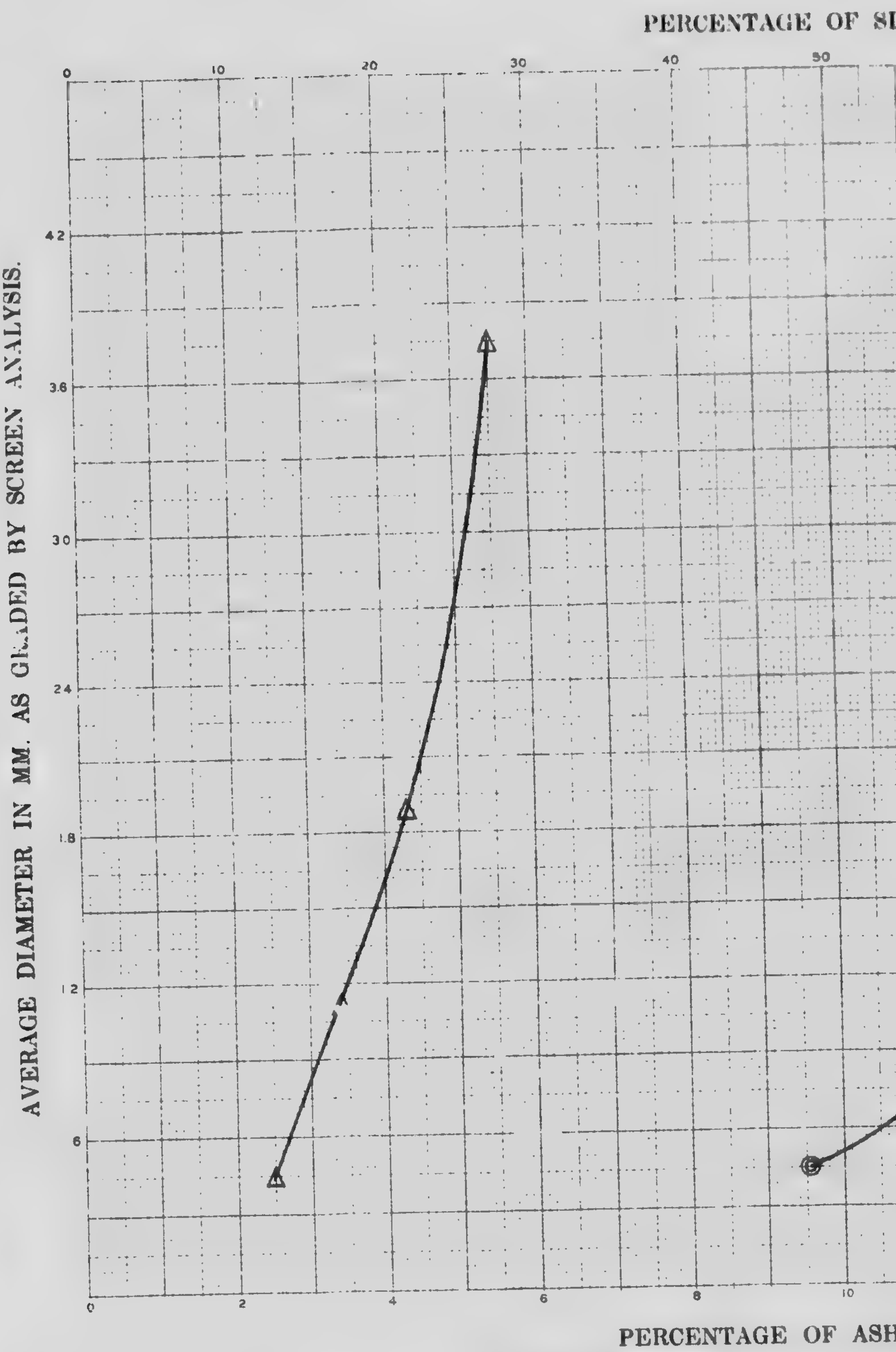
Summary Statement of Effect of Washing on Fuel Values.

31.	Recovery of washed coal, including good bone %	....	Ratio to standard	....
32.	Reduction in ash %	....	" "	....
33.	" " sulphur %	....	" "	....
34.	Increase in calorific value—calorimeter %	...		
35.	Increase in evaporation under boiler %			
36.	Decrease in clinker under boiler %			
37.	Fuel ratio of original coal	....		
38.	" " washed "	....		
39.	Calorific value of original coal			
40.	" " washed "			

Remarks on Tables B, C, D, and E.—It was not considered necessary to wash this sample.

AVERAGE DIAMETER IN MM. AS GRADED BY SCREEN ANALYSIS.
0
.6
1.2
1.8
2.4
3.0
3.6
4.2

GRAPHIC RECORD OF SIZING A

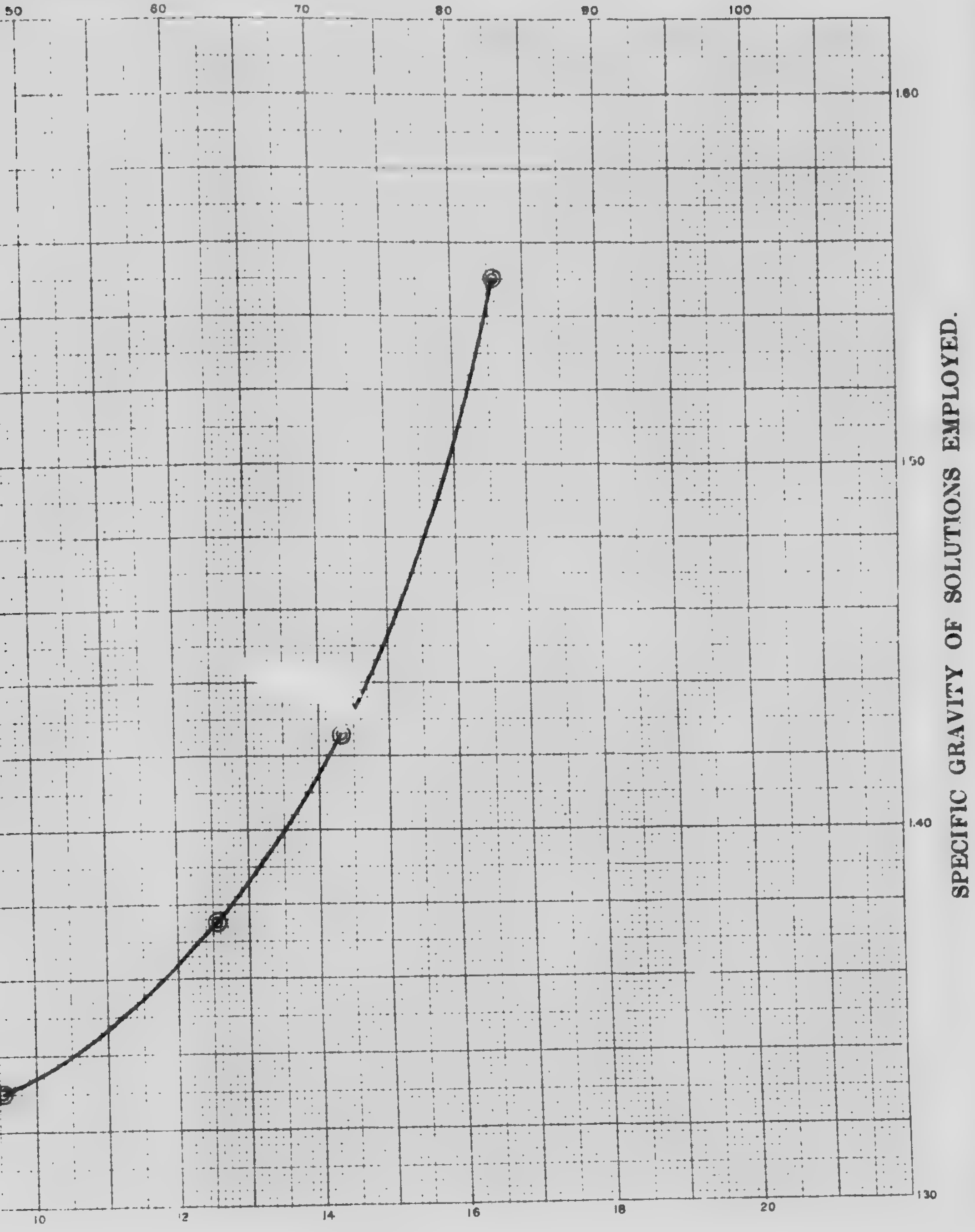


LEGEND: SYMBOLS.

○ Showing the relative quantities of the several sizes.
△ " " " " " " densities.
□ " " percentage of ash in each of the several sizes.
○ " " " " " material floating at the several

ING AND SPECIFIC GRAVITY TESTS.

OF SIZE AND OF FLOAT.



COAL No. 50
APPENDIX I, VOL. III

ses.
ne several densities.

COAL.—No. 36.

Locality.—Glace Bay, C.B., N.S.

Colliery.—Dominion Coal Co. No. 7 or Hub.

Sample.—One hundred and twenty-five bags from the Hub seam. The sample was lump coal from the submarine areas, and had all passed over a 2½" shaking screen and then a picking table. Sampled June 24, 1908.

TABLE A.

Specific Gravity Tests.

	Specific gravity of solution.	Float %	Ash in Float %	Sink %	Ash in Sink %
1.	1·530	93·7	2·4	6·3	58·0
2.	1·405	91·4	2·2	8·6	46·5
3.	1·360	89·0	1·7	11·0	40·0
4.	1·330	81·2	1·5	18·8	25·0

The following results are obtained from the above data, and the chemists reports:—

5. Good coal, Sp. Gr. under 1·375 .... % yield 90·5 % ash 1·9
6. Bone coal, Sp. Gr. 1·375 to 1·55 .... " " 3·5 " " 13·8
7. Useful coal—sum of (5) and (6) .... " " 94·0 " 2·4
8. Refuse, Sp. Gr. over 1·55 .... " " 6·0 " " 60·9
9. Assay of original sample raw coal as sent to chemist .... " " 5·9
10. " " " " " " .... % sulphur 2·4
11. " " " " " " .... Fuel Ratio 1·58
12. Assay of mixed good and bone coal (5) and (6) .... " " 1·53

Remarks.—The coal contains very little innate ash, and unusually small quantities of bone and refuse, the former low and the latter very high in ash. The coal is an ideal one for washing so far as improvement in ash is concerned, and the sulphur would also be considerably reduced. The total amount of ash is, however, so low as to render washing commercially unnecessary.

TABLE B.

Screen Analysis.

	Maximum Screen MM.	Minimum Screen MM.	Mean MM.	% of whole sample	% Ash in size.
13.	6·34	3·16	4·75	33·2	8·1
14.	3·16	1·20	2·18	21·6	6·8
15.	1·20	0·64	0·92	15·4	4·9
16.	0·64	0·30	0·47	10·1	5·2
17.	0·30	0·173	0·24	10·1	5·3
18.	0·173	0·000	0·086	9·6	5·8

Remarks.—This coal is more friable than samples from the deeper seams of the vicinity, unless, perhaps, from the Phalen seam at Dominion No. 1. The main portion of the refuse seems to be less friable than the coal.

TABLE C.

Results of Washing (Details of Sizes).

	Original coal and its products.	Sizes between 1" and ½" Total wt. lbs.	Ash. %	Sizes between ½" and ¼" Total wt. lbs.	Ash. %	Sizes under ¼" Total wt lbs.	Ash. %
19.	Original coal........	2533	6·3	1766	7·0	1121	5·2
20.	Washed coal........	2366	2·9	1644	2·4	996	2·7
21.	Refuse—coarse.....	152	59·2	76	50·3	52	47·0
22.	Hutch product......	17	25·7	14	31·6		
23.	Jig slimes..........	....	....	12	20·0		
24.	Table slimes........	....	....	....	....	5	

TABLE D.

Results of Washing (Totals).

25.	Original coal........................	wt. in lbs.	5420	% ash		5·9	% sulphur		2·4
26.	Washed coal........................	"	"	5006	"	"	2·7	"	"	2·0
27.	Refuse............................	"	"	280	"	"	54·0	"	"	
28.	Other products....................	"	"	92	"	"	....	"	"	
29.	Loss.............................	"	"	42	"	"	....	"	"	

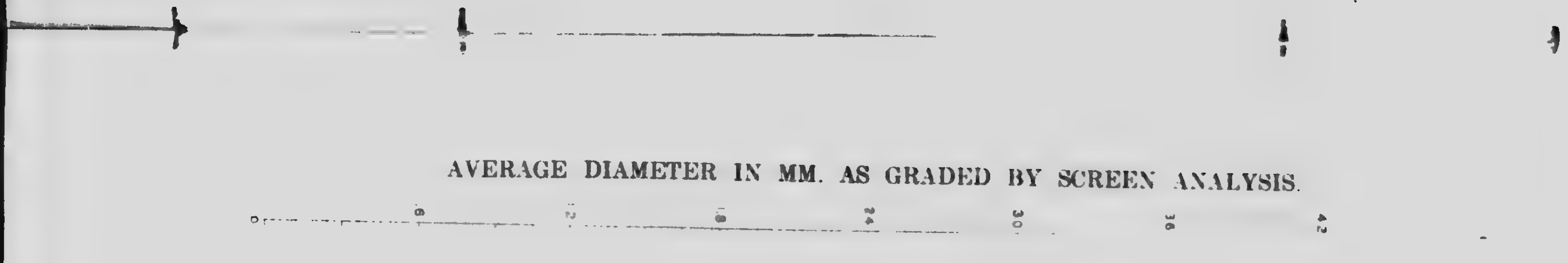
30. Loss in % 0·8.

TABLE E.

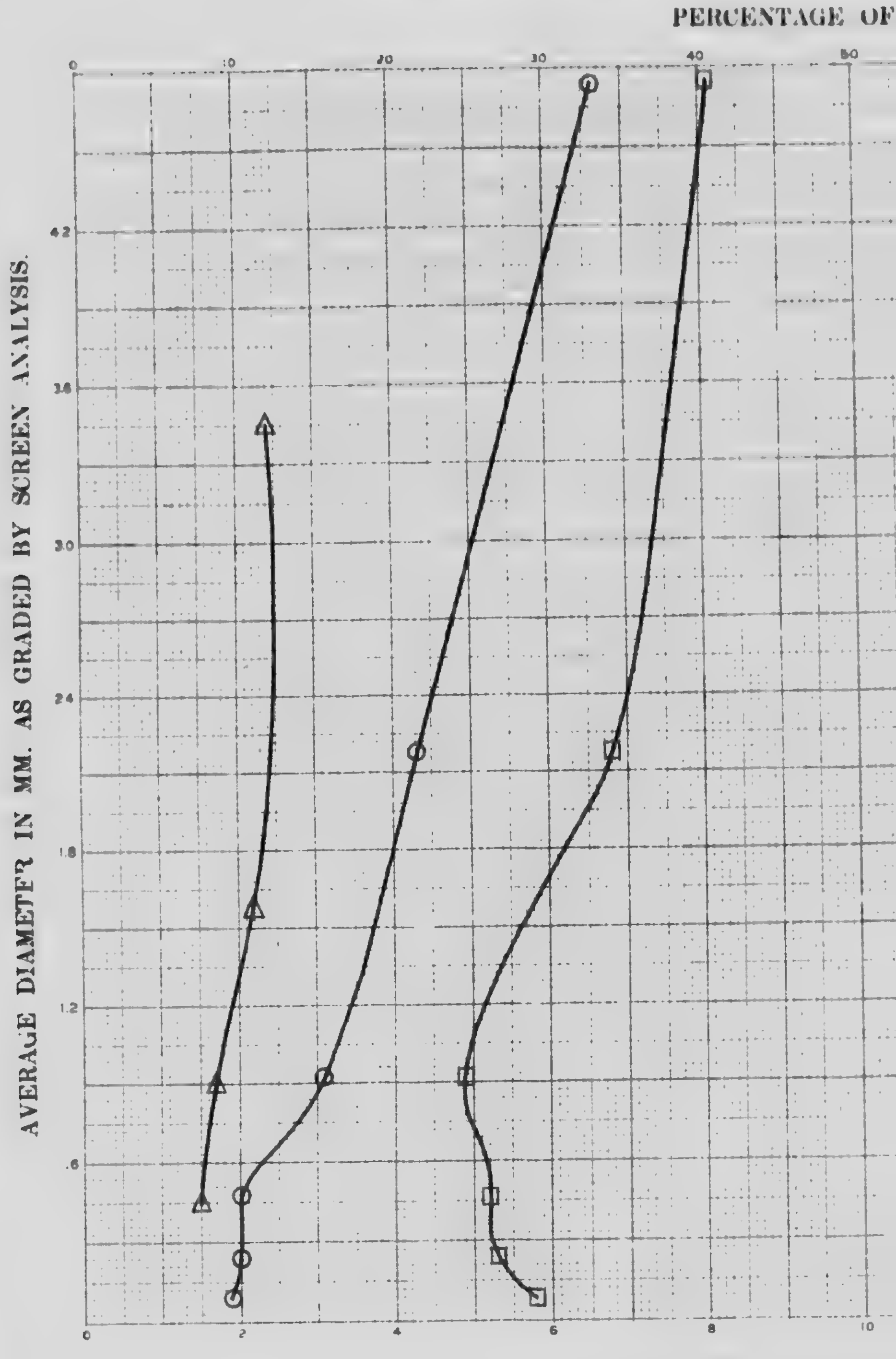
Summary Statement of Effect of Washing on Fuel Values.

31.	Recovery of washed coal, including good bone...... %	92·5	Ratio to standard	98·4
32.	Reduction in ash.............................. %	54·3	" "	88·9
33.	" " sulphur........................... %	16·7	" "	80·0
34.	Increase in calorific value—calorimeter........... %	3·2		
35.	Increase in evaporation under boiler............. %	5·6		
36.	Decrease in clinker under boiler................ %	60·9		
37.	Fuel ratio of original coal	1·58		
38.	" " washed "	1·55		
39.	Calorific value of original coal	7700		
40.	" " washed "	7950		

Remarks on Tables C, D, and E.—This washing trial was thoroughly successful, and increased the evaporative power and decreased clinker in a satisfactory way. It is improbable, however, that washing would be commercially desirable for lump coal; although it might be profitable for screenings.


AVERAGE DIAMETER IN MM. AS GRADED BY SCREEN ANALYSIS.
0
.6
1.2
1.8
24
30
36
42

GRAPHIC RECORD OF SIZING

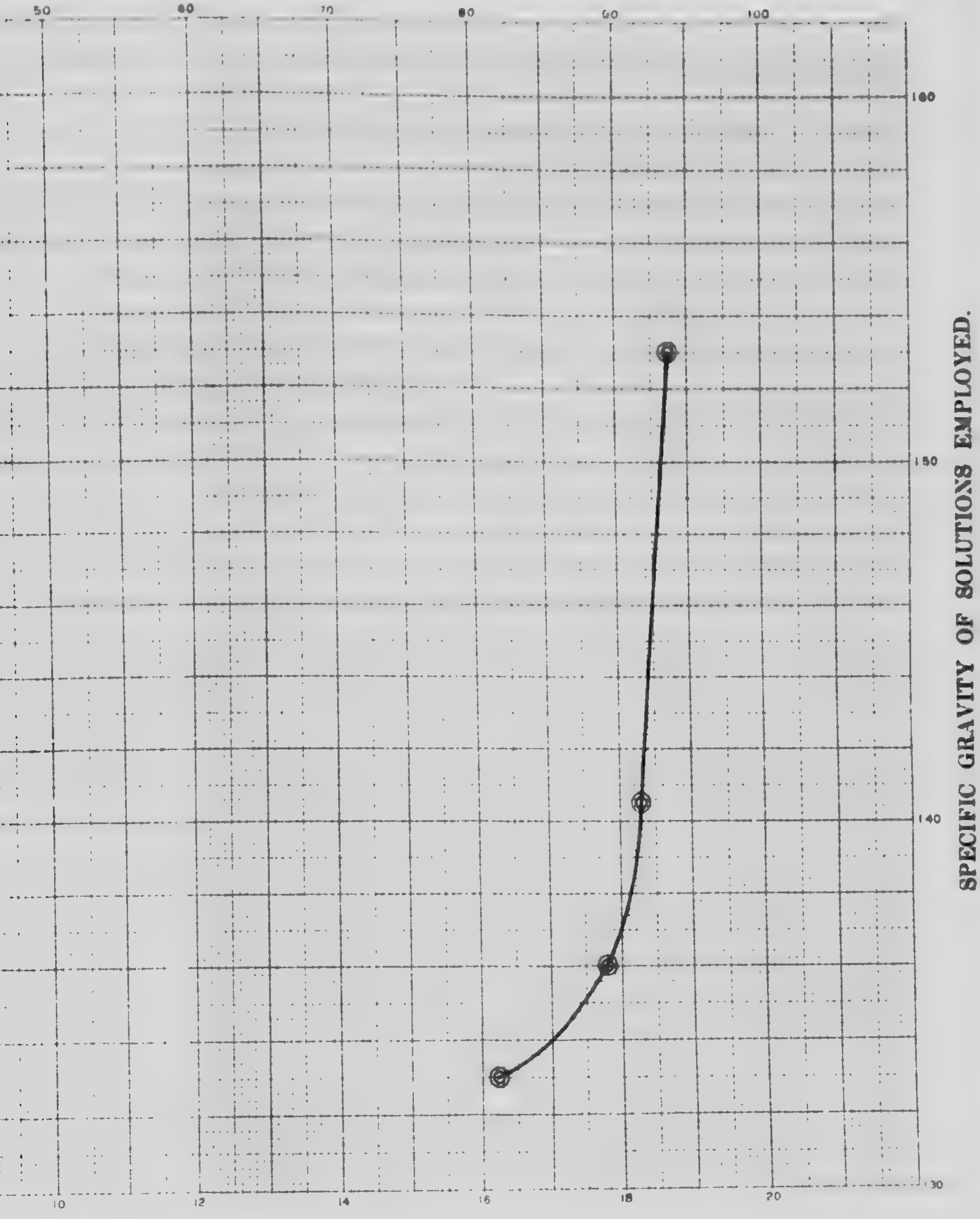


LEGEND: SYMBOLS.

○ Curve showing the relative quantities of the several sizes.
△ " " " " " " " densities.
□ " " " percentage of ash in each of the several sizes.
◎ " " " " " " " material floating at the severa

IZING AND SPECIFIC GRAVITY TESTS.

AGE OF SIZE AND OF FLOAT.



OF ASH IN SIZE AND IN FLOAT.

COAL No. 36
APPENDIX I, VOL. III

sizes.
the several densities.

COAL.—No. 35.

Locality.—Glace Bay, C.B., N.S.

Colliery.—Dominion Coal Co. No. 9, Harbour seam.

Sample.—Sample of sixty-five sacks of lump coal, which had been passed over a 2½″ bar screen and then hand picked. Coal from this seam is used chiefly as domestic fuel. Sampled June 23, 1908.

TABLE A.

Specific Gravity Tests.

	Specific gravity of solution.	Float %	Ash in Float %	Sink %	Ash in Sink %
1.	1·530	91·9	3·0	8·1	47·7
2.	1·450	88·8	2·9	11·2	39·3
3.	1·370	86·3	2·8	13·7	32·1
4.	1·330	82·5	2·1	17·5	28·9

The following results are obtained from the above data, and the chemists reports :—

5. Good coal, Sp. Gr. under 1 375 . . .
6. Bone coal, Sp. Gr. 1·375 to 1·55 . . . % yield 86·5 % ash 2·8
7. Useful coal—sum of (5) and (6) . . . . . . " " 6·5 " " 6·1
8. Refuse, Sp. Gr. over 1·55 . . . . . . " " 93·0 " " 3·0
9. Assay of original sample raw coal as sent to chemist . . . " " 7·0 " " 50·0
10. " " " " " " . . . . . . " " 5·9
11. " " " " " " . . . . . . % sulphur 3·7
12. Assay of mixed good and bone coal (5) and (6) . . . Fuel Ratio 1·44
. . . . . . " " 1·52

Remarks.—This coal contains comparatively little ash, and comparatively small quantities of bone and refuse, the former low in ash. The coal can be improved by washing, but it is already good enough as it stands. The screenings were not sampled, but it is probable that they contain more refuse, and, therefore, would be considerably improved by washing.

TABLE B.

Screen Analysis.

	Maximum Screen MM.	Minimum Screen MM.	Mean MM.	% of whole sample	% Ash in size
13.	6·34	3·16	4·75	50·4	6·4
14.	3·16	1·20	2·18	15·7	5·6
15.	1·20	0·64	0·92	11·5	5·9
16.	0·64	0·30	0·47	8·3	6·8
17.	0·30	0·173	0·24	8·5	8·5
18.	0·173	0·000	0·086	5·6	12·7

Remarks.—This coal is only moderately strong and the small amount of ash is largely due to the fact that the sample consisted entirely of lump. The ash-bearing material is, on the whole, more friable than the purer coal.

TABLE C.

Results of Washing (Details of Sizes).

Original coal and its products.	Sizes between 1″ and ½″ Total wt. lbs.	Ash. %	Sizes between ½″ and ⅛″ Total wt. lbs.	Ash. %	Sizes under ⅛″ Total wt. lbs.	Ash. %
19. Original coal . . .						
20. Washed coal. . . .	Not washed.					
21. Refuse—coarse. .						
22. Hutch product. .						
23. Jig slimes.						
24. Table slimes. . . .						

TABLE D.

Results of Washing (Totals).

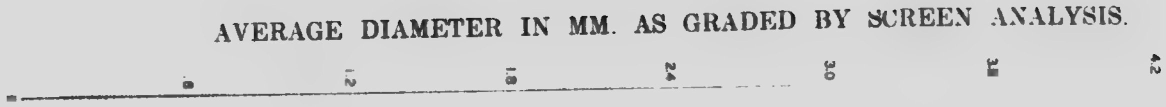
25. Original coal	wt. in lbs.	% ash	% sulphur . . . .
26. Washed coal.	" "	" "	" " . . . .
27. Refuse.	" "	" "	" " . .
28. Other products.	" "	" "	" " . . . .
29. Loss.	. . . .		
30. Loss in %			

TABLE E.

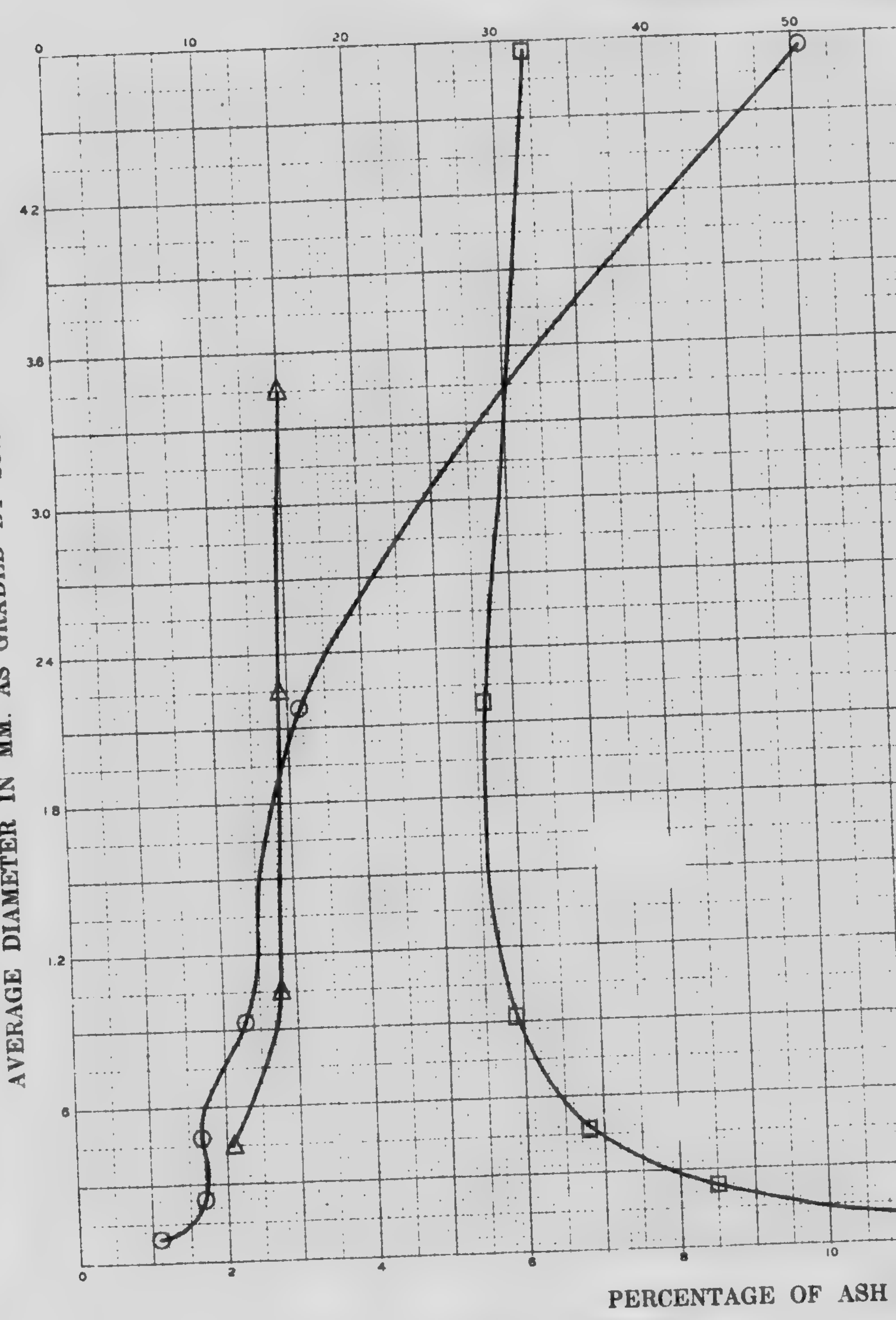
Summary Statement of Effect of Washing on Fuel Values.

31. Recovery of washed coal, including good bone . . .	%	Ratio to standard . . . .
32. Reduction in ash	%	" " . . . .
33. " " sulphur.	%	" " . .
34. Increase in calorific value—calorimeter.	%	
35. Increase in evaporation under boiler.	%	
36. Decrease in clinker under boiler	%	
37. Fuel ratio of original coal.		
38. " " washed "		
39. Calorific value of original coal.		
40. " " washed "		

Remarks on Tables C, D, and E.—Owing to the small amount of ash in this coal, and to the fact that the sulphur could not be largely reduced, the sample was not washed on a large scale.


AVERAGE DIAMETER IN MM. AS GRADED BY SCREEN ANALYSIS.
0
.6
1.2
1.8
2.4
3.0
3.6
4.2

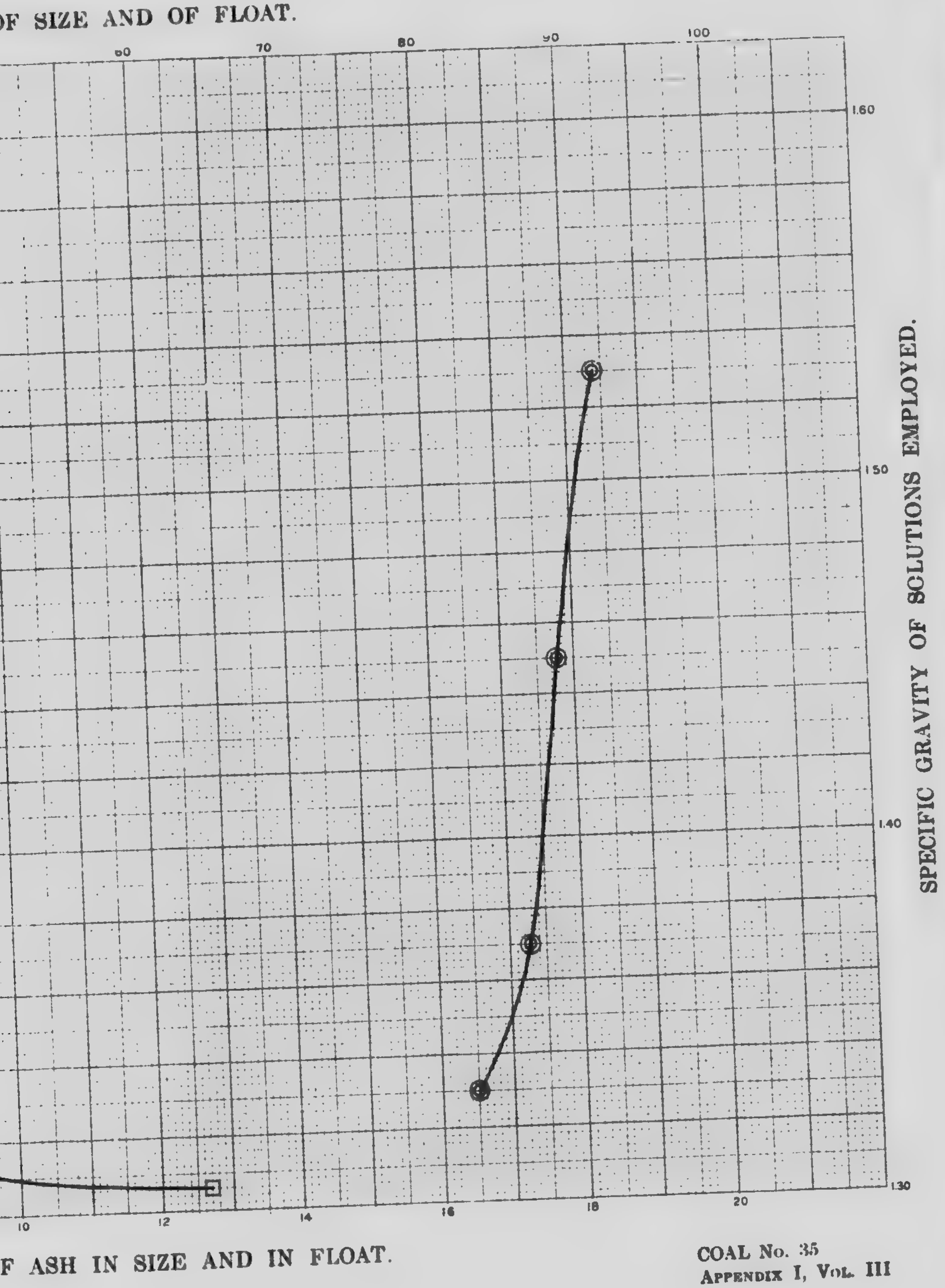
GRAPHIC RECORD OF SIZING AN



LEGEND: SYMBOLS.

○ Curve showing the relative quantities of the several sizes.
△ " " " " " " " densities.
□ " " " percentage of ash in each of the several sizes.
◎ " " " " " " " material floating at the several d

G AND SPECIFIC GRAVITY TESTS.



COAL No. 35
APPENDIX I, VOL. III

s.
several densities.

COAL.—No. 35 SP.

Locality.—Reserve, C.B., N.S.

Colliery.—Dominion Coal Co. No. 5, or Reserve colliery, on Phalen seam.

Sample.—A small sample of twenty-five sacks of lump coal which had been screened over 1½″ and then hand picked.

TABLE A.

Specific Gravity Tests.

	Specific gravity of solution.	Float %	Ash in Float %	Sink %	Ash in Sink %
1.	1·520	96·0	3·4	4·0	56·5
2.	1·415	92·2	3·0	7·8	32·6
3.	1·370	90·1	2·7	10·0	30·3
4.	1·340	88·6	2·7	11·4	26·3

The following results are obtained from the above data and the chemists reports :—

5. Good coal, Sp. Gr. under 1·375 .... % yield 90·5 % ash 2·7
6. Bone coal, Sp. Gr. 1·375 to 1·55 .... " " 7·5 " " 12·5
7. Useful coal—sum of (5) and (6) .... " " 98·0 " 3·0
8. Refuse, Sp. Gr. over 1·55 .... " " 2·0 " " 66·0
9. Assay of original sample raw coal as sent to chemist .... " " 5·5
10. " " " " " " .... % sulphur 1·8
11. " " " " " " .... Fuel Ratio 1·70
12. Assay of mixed good and bone coal (5) and (6) .... " 1·63

Remarks.—The innate ash is low, and the bone and refuse are also low in quantity, the former with little ash and the latter with high ash. Washing would considerably reduce the amount of ash, and would improve the coal in the matter of sulphur, but it is unnecessary, as the coal is already good enough. It is possible that the screenings could be washed with advantage.

TABLE B.

Screen Analysis.

	Maximum Screen MM.	Minimum Screen MM.	Mean MM.	% of whole sample	% Ash in size.
13.	6·34	3·16	4·75	52·7	5·0
14.	3·16	1·20	2·18	20·1	5·0
15.	1·20	0·64	0·92	12·6	4·7
16.	0·64	0·30	0·47	6·4	4·8
17.	0·30	0·173	0·24	5·0	6·7
18.	0·173	0·000	0·086	3·4	6·8

Remarks.—The coal is fairly strong, and stands shipment and crushing well, making but a small amount of fines. It is probable that there are two ash-bearing materials, one more friable, and the other less friable than the coal itself. As a result, the average amount of ash in all sizes is approximately constant.

TABLE C.

Results of Washing (Details of Sizes).

	Original coal and its products.	Sizes between 1″ and ½″ Total wt. lbs.	Ash. %	Sizes between ½″ and ⅛″ Total wt. lbs.	Ash. %	Sizes under ⅛″ Total wt. lbs.	Ash. %
19.	Original coal ...	Not washed.					
20.	Washed coal....						
21.	Refuse—coarse..						
22.	Hutch product..						
23.	Jig slimes.....						
24.	Table slimes..						

TABLE D.

Results of Washing (Totals).

25.	Original coal	wt. in lbs.	% ash	% sulphur ..
26.	Washed coal........................	" "	" "	" "
27.	Refuse........................	" "	" "	" " ....
28.	Other products........................	" "	" "	" "
29.	Loss........................	" "	" "	" " ....
30.	Loss in %		....	....

TABLE E.

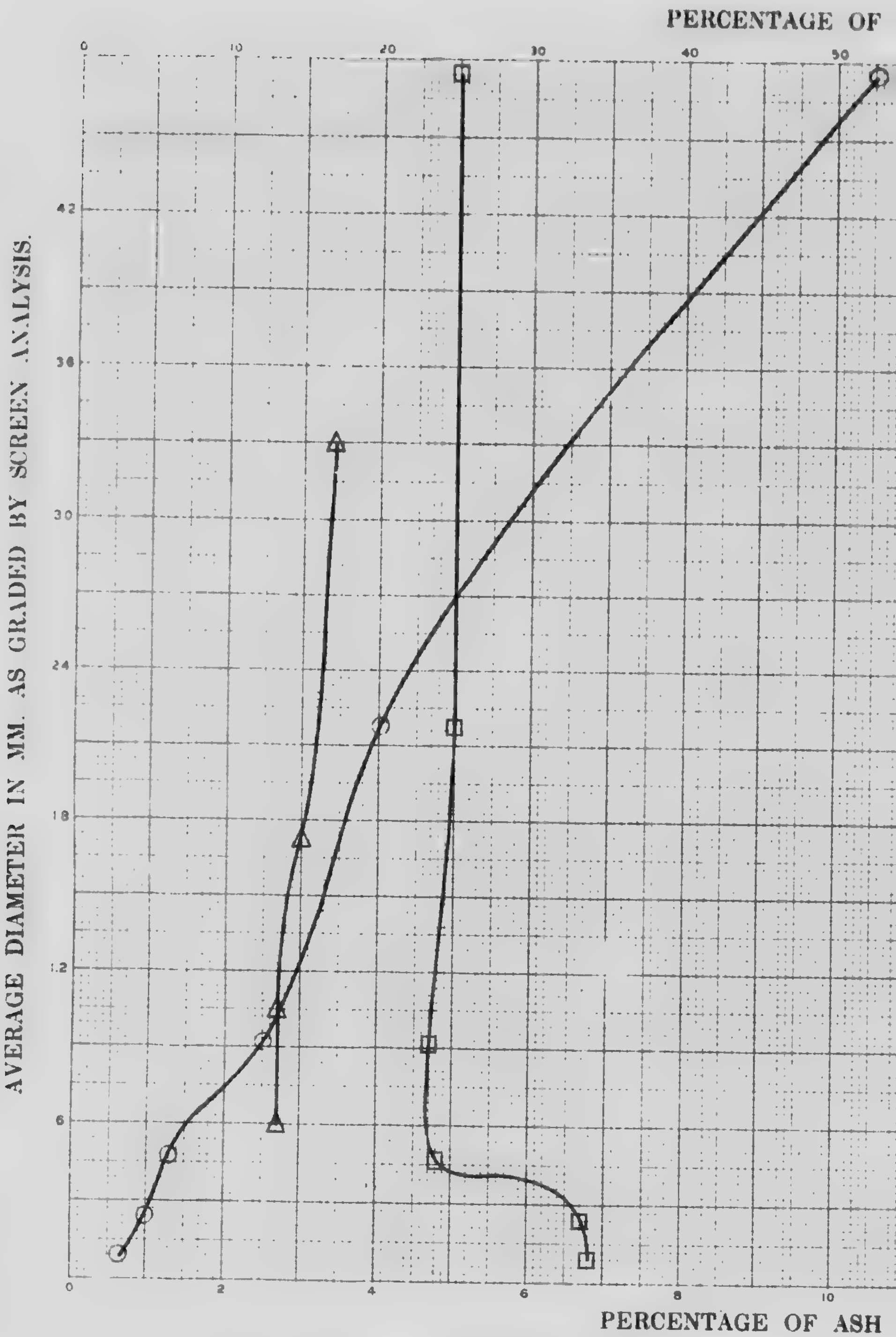
Summary Statement of Effect of Washing on Fuel Values.

31.	Recovery of washed coal, including good bone. ..	%	Ratio to standard	....
32.	Reduction in ash........................	%	" "	...
33.	" " sulphur........................	% ..	" "	....
34.	Increase in calorific value—calorimeter	% .		
35.	Increase in evaporation under boiler...........	% .		
36.	Decrease in clinker under boiler...............	% .		
37.	Fuel ratio of original coal..................			
38.	" " washed "			
39.	Calorific value of original coal................			
40	" " washed "			

Remarks on Tables C, D, and E.—It was not considered necessary to wash this sample.

AVERAGE DIAMETER IN MM. AS GRADED BY SCREEN ANALYSIS.
0
6
12
18
24
30
36
42

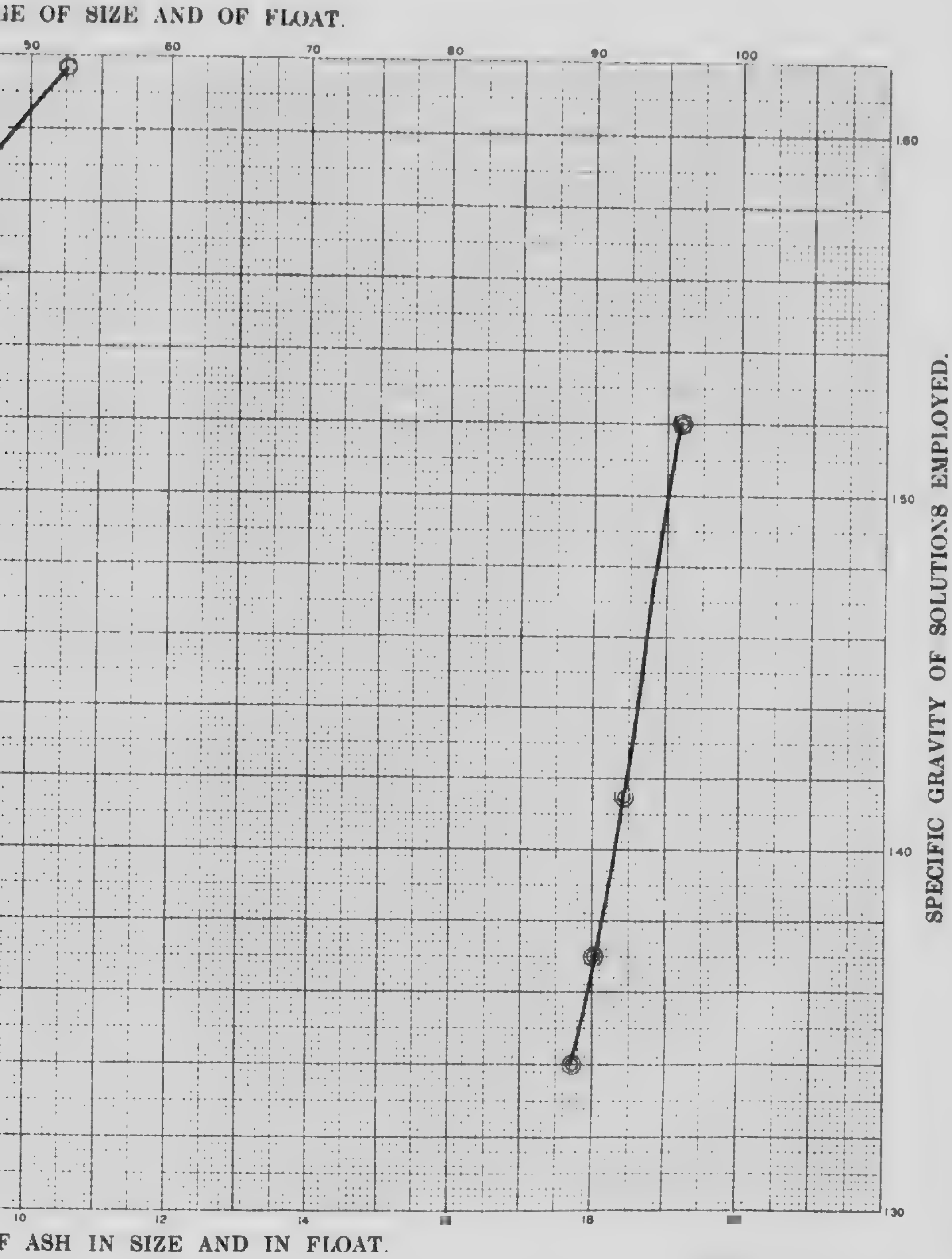
GRAPHIC RECORD OF SIZING



LEGEND: SYMBOLS.

○ Curve showing the relative quantities of the several sizes.
△ " " " " " " " " densities.
□ " " " percentage of ash in each of the several sizes.
◎ " " " " " " " material floating at the several de

ZING AND SPECIFIC GRAVITY TESTS.



COAL No. 35 S.P
Appendix I, Vol. III

several densities.

COAL. No. 38.

Locality.—Dominion, C.B., N.S.

Colliery.—Dominion Coal Co., Dominion Mine No. 1, Phalen seam.

Sample.—One hundred and twenty-five sacks of coal which had been screened over 1″ and then hand picked. Sampled June 26, 1908.

TABLE A

Specific Gravity Tests.

	Specific gravity of solution.	Float %	Ash in Float %	Sink %	Ash in Sink %
1.	1·525	93·5	3·5	6·5	44·2
2.	1·450	91·6	3·4	8·4	34·6
3.	1·360	86·9	2·4	13·1	28·5
4.	1·310	71·6	1·6	28·1	18·3

The following results are obtained from the above data and the chemists reports :

5.	Good coal, Sp. Gr. under 1·375	% yield	88·3	% ash	2·6
6.	Bone coal, Sp. Gr. 1·375 to 1·55	" "	5·2	" "	18·2
7.	Useful coal—sum of (5) and (6)	" "	93·5	" "	3·5
8.	Refuse, Sp. Gr. over 1·55	" "	6·5	" "	48·3
9.	Assay of original sample raw coal as sent to chemist			" "	5·9
10.	" " " " " "			% sulphur	1·9
11.	" " " " " "			Fuel Ratio	1·74
12.	Assay of mixed good and bone coal (5) and (6)			" "	1·65

Remarks.—This coal is t the same seam as sample No. 35 SP, and the mines are adjoining. The only considerable difference between the coals is that the refuse contains much less ash. Washing would considerably reduce the ash, but is unnecessary, particularly as the sulphur cannot be considerably reduced.

TABLE B.

Screen Analysis.

	Maximum Screen MM.	Minimum Screen MM.	Mean MM.	% of whole sample	% Ash in size
13.	6·34	3·16	4·75	27·0	8·4
14.	3·16	1·20	2·18	25·0	5·7
15.	1·20	0·64	0·92	18·3	5·2
16.	0·64	0·30	0·47	10·7	4·9
17.	0·30	0·173	0·24	8·9	5·1
18.	0·173	0·000	0·086	10·1	8·0

Remarks.—There is a considerable amount of fine coal as compared with the other samples from the district, but this is partly due to the fact that the sample had been passed over a much smaller screen than in most of the other Dominion Company coals. The coal seems more friable than other samples from the district, except that from the Hub seam, No. 36.

TABLE C

Results of Washing (Details of Sizes).

Original coal and its products.	Size between 1" and ½" Total wt. lbs.	Ash %	Sizes between ½" and ⅛" Total wt. lbs.	Ash %	Sizes under ⅛" Total wt. lbs.	Ash %
19. Original coal						
20. Washed coal						
21. Refuse—coarse	Not washed					
22. Hutch product						
23. Jig slimes						
24. Table slimes						

TABLE D.

Results of Washing (Totals).

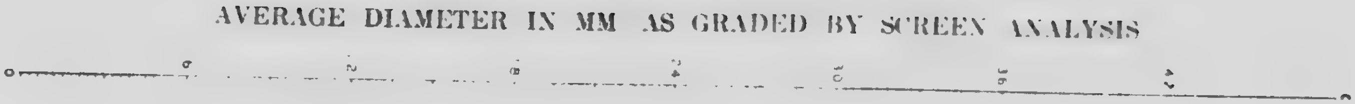
	wt. in lbs.	% ash	% sulphur
25. Original coal			
26. Washed coal			
27. Refuse			
28. Other products			
29. Loss			
30. Loss in %			

TABLE E

Summary Statement of Effect of Washing on Fuel Values.

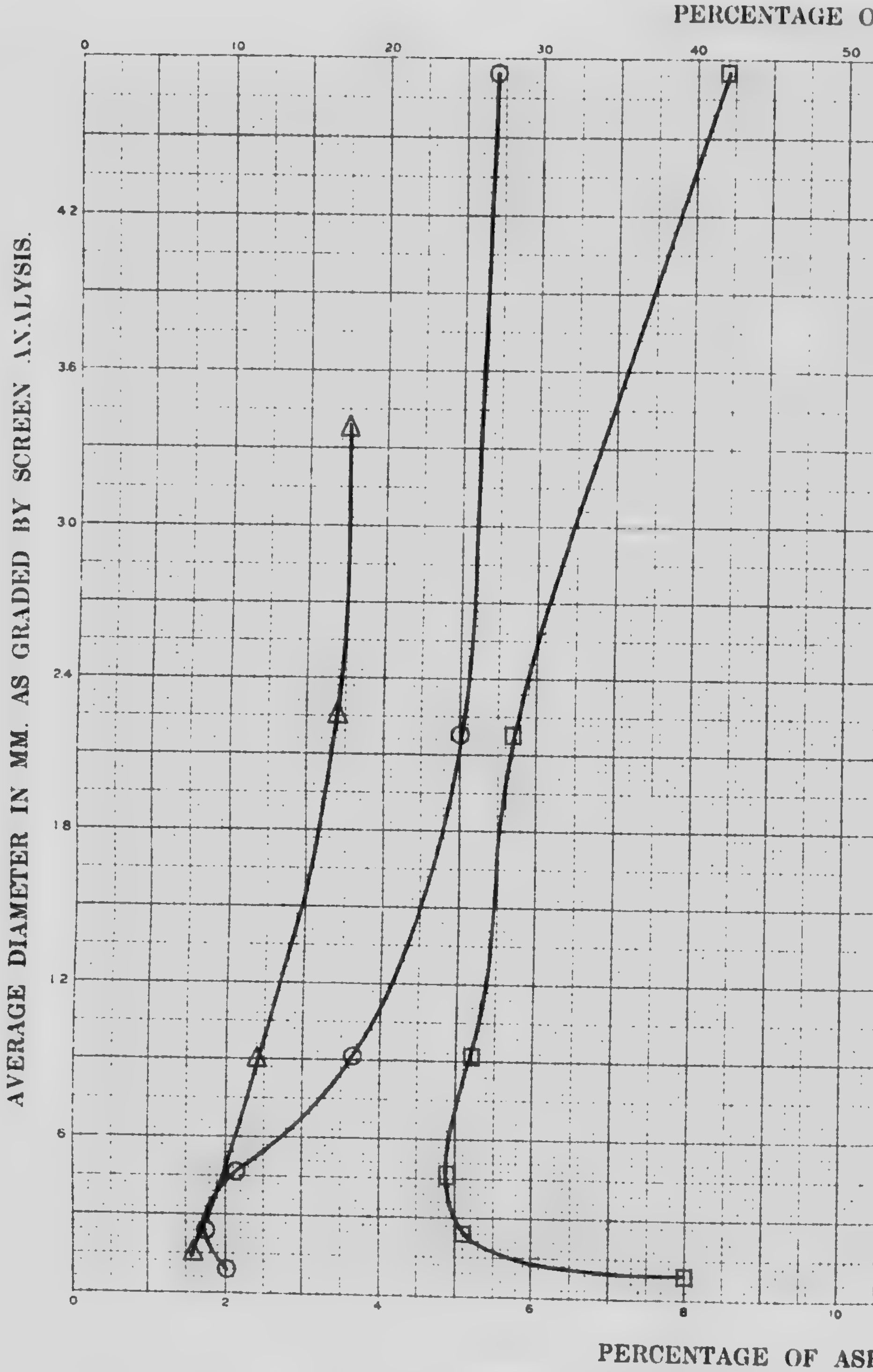
	%	Ratio to standard
31. Recovery of washed coal, including good bone		
32. Reduction in ash		
33. " " sulphur		
34. Increase in calorific value		
35. Increase in evaporation under boiler		
36. Decrease in clinker under boiler		
37. Fuel ratio of original coal		
38. " " washed "		
39. Calorific value of original coal		
40. " " washed "		

Remarks on Tables C, D, and E. It was not considered necessary to wash this sample.



AVERAGE DIAMETER IN MM AS GRADED BY SCREEN ANALYSIS
0
6
12
18
24
30
36
42

GRAPHIC RECORD OF SIZI



LEGEND: SYMBOLS.

○ Curve showing the relative quantities of the several sizes.

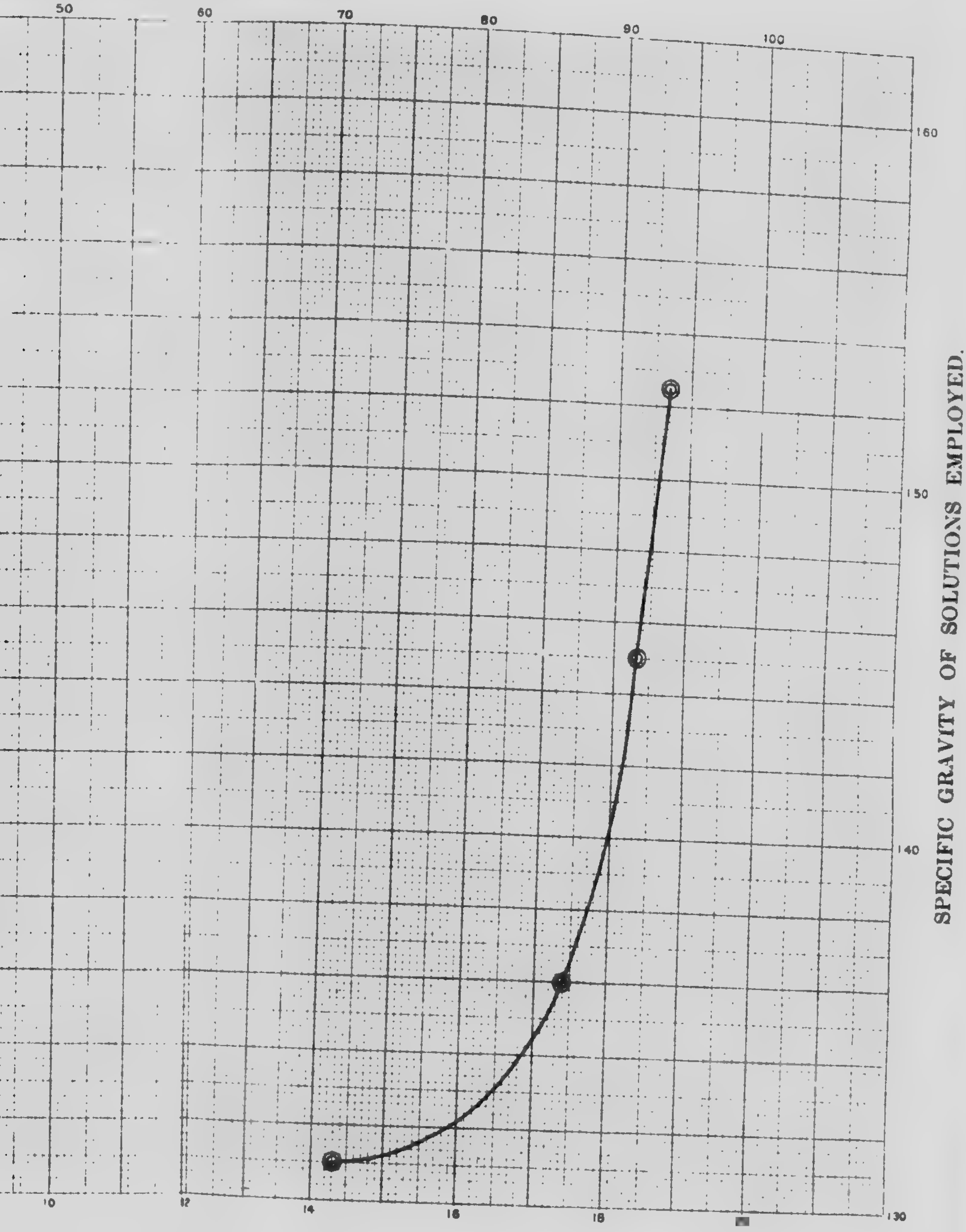
△ " " " " " " " " densities.

□ " " " percentage of ash in each of the several sizes.

◉ " " " " " " " material floating at the several

SIZING AND SPECIFIC GRAVITY TESTS.

TAGE OF SIZE AND OF FLOAT.



OF ASH IN SIZE AND IN FLOAT.

COAL No. 38
APPENDIX I, VOL. III

ses.
he several densities

COAL.—No. 37.

Locality.—Reserve, C.B., N.S.

Colliery.—Dominion Coal Co., No. 10 mine, Emery seam.

Sample.—Sample of one hundred and twenty-five sacks of unscreened run of mine, which, however, had been hand picked. Sampled June 25, 1908.

TABLE A.

Specific Gravity Tests.

	Specific gravity of solution.	Float %	Ash in Float %	Sink %	Ash in Sink %
1.	1·526	86·7	5·1	13·7	58·1
2.	1·400	81·1	4·0	18·9	45·2
3.	1·360	73·9	3·2	26·1	35·2
4.	1·325	57·4	2·4	42·6	23·5

The following results are obtained from the above data and the chemists reports :—

5.	Good coal, Sp. Gr. under 1·375	% yield	77·5	% ash	3·5
6.	Bone coal, Sp. Gr. 1·375 to 1·55	" "	9·5	" "	18·1
7.	Useful coal—sum of (5) and (6)	" "	87·0	" "	5·2
8.	Refuse, Sp. Gr. over 1·55	" "	13·0	" "	60·0
9.	Assay of original sample raw coal as sent to chemist			" "	11·1
10.	" " " " " "			% sulphur	2·5
11.	" " " " " "			Fuel Ratio	1·53
12.	Assay of mixed good and bone coal (5) and (6)			" "	1·43

Remarks.—The innate ash is higher than in any other of the coals of the neighbourhood. There are, also, large proportions of bone and refuse, the latter, particularly, being high in ash. The coal could be largely improved by washing.

TABLE B.

Screen Analysis.

	Maximum Screen MM.	Minimum Screen MM.	Mean MM.	% of whole sample	% Ash in size.
13.	6·34	3·16	4·75	50·1	11·8
14.	3·16	1·20	2·18	17·9	11·6
15.	1·20	0·64	0·92	11·5	11·3
16.	0·64	0·30	0·47	7·3	10·3
17.	0·30	0·173	0·24	6·3	9·7
18.	0·173	0·000	0·086	6·9	9·9

Remarks.—The coal is not friable, and the proportion of fines in the sample is quite moderate in view of the fact that the sample itself was run of mine. The refuse is less friable than the coal.

TABLE C.

Results of Washing (Details of Sizes).

	Original coal and its products.	Sizes between 1″ and ½″ Total wt. lbs.	Ash. %	Sizes between ½″ and ¼″ Total wt. lbs.	Ash. %	Sizes under ¼″ Total wt. lbs.	Ash. %
19.	Original coal	3170	10·2	1757	9·1	1214	. . .
20.	Washed coal	2790	5·6	1566	5·4	973	
21.	Refuse—coarse.	348	46·6	174	46·0	113	. .
22.	Hutch product.	24	46·9	8	63·4	. . .	.
23	Jig slimes.	. .	. .	17	19·1	. . . .	.
24.	Table slimes.	.	.	. . .	. . .	105	. .

TABLE D

Results of Washing (Totals).

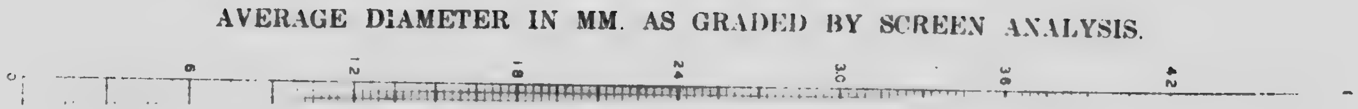
25.	Original coal	wt. in lbs.	6141	% ash	11·1	% sulphur	2·5
26.	Washed coal	" "	5434	" "	5·8	" "	2·1
27.	Refuse	" "	635	" "	47·0	" "	. . .
28.	Other products	" "	73	" "	.	" "	
29.	Loss	" "	0	" "	. .	" ..	.
30	Loss in % 0·0						

TABLE E.

Summary Statement of Effect of Washing on Fuel Values.

31.	Recovery of washed coal, including good bone.... %	88·5	Ratio to standard	101·8
32.	Reduction in ash %	47·8	" "	89·6
33.	" " sulphur %	16·0	" "	57·1
34.	Increase in calorific value—calorimeter %	5·7		
35.	Increase in evaporation under boiler %	5·8		
36.	Decrease in clinker under boiler %	52·2		
37.	Fuel ratio of original coal	1·53		
38.	" " washed "	1·55		
39.	Calorific value of original coal	7290		
40.	" " washed "	7710		

Remarks on Tables C, D, and E.—The trial was thoroughly successful as far as reduction in ash is concerned. The recovery is also good. The reduction in sulphur should have been better, and no doubt would be in a commercial washery, the product of which also should be even better than the trial in respect to the ash and recovery.


AVERAGE DIAMETER IN MM. AS GRADED BY SCREEN ANALYSIS.
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3.0
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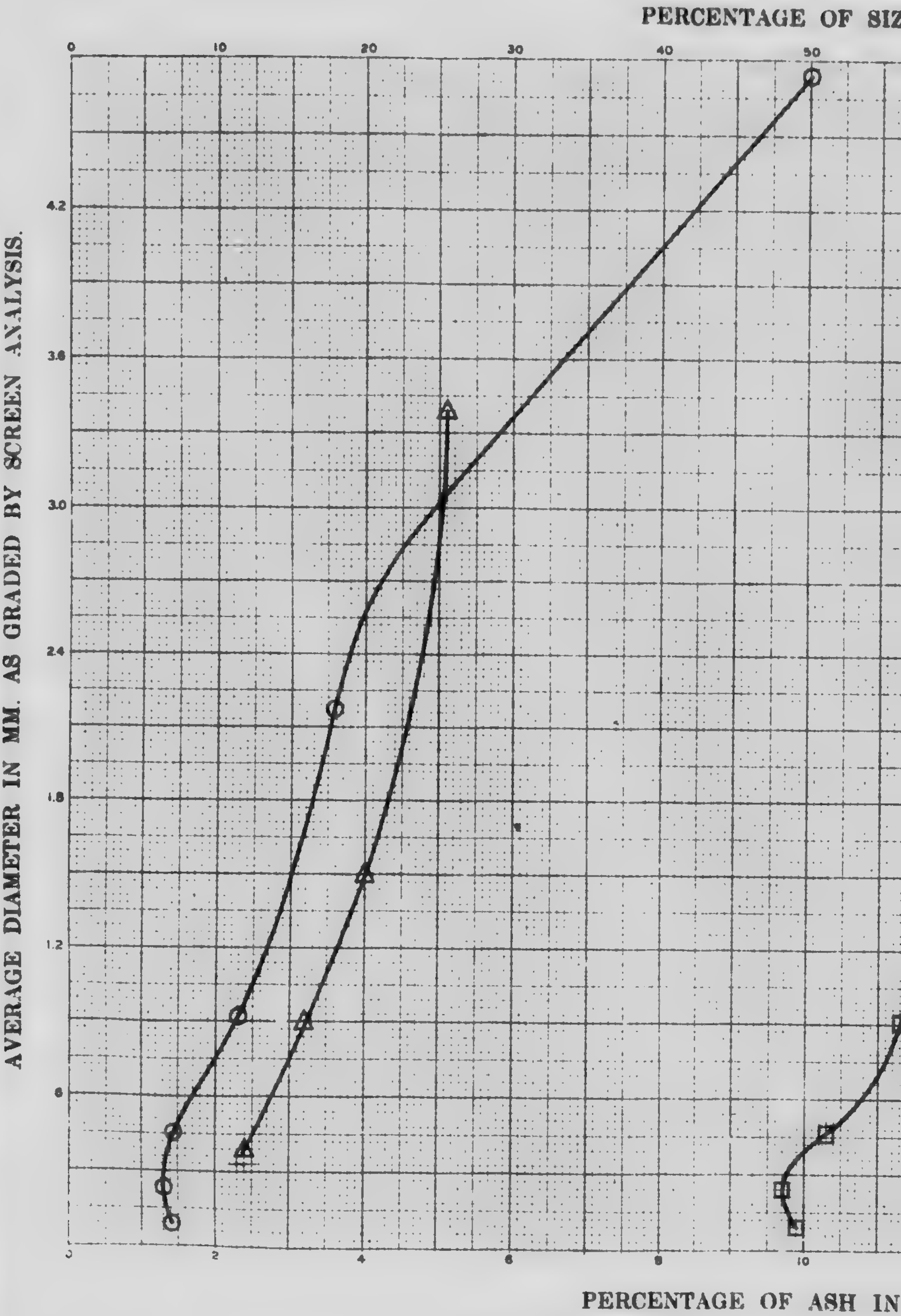
42

GRAPHIC RECORD OF SIZING A

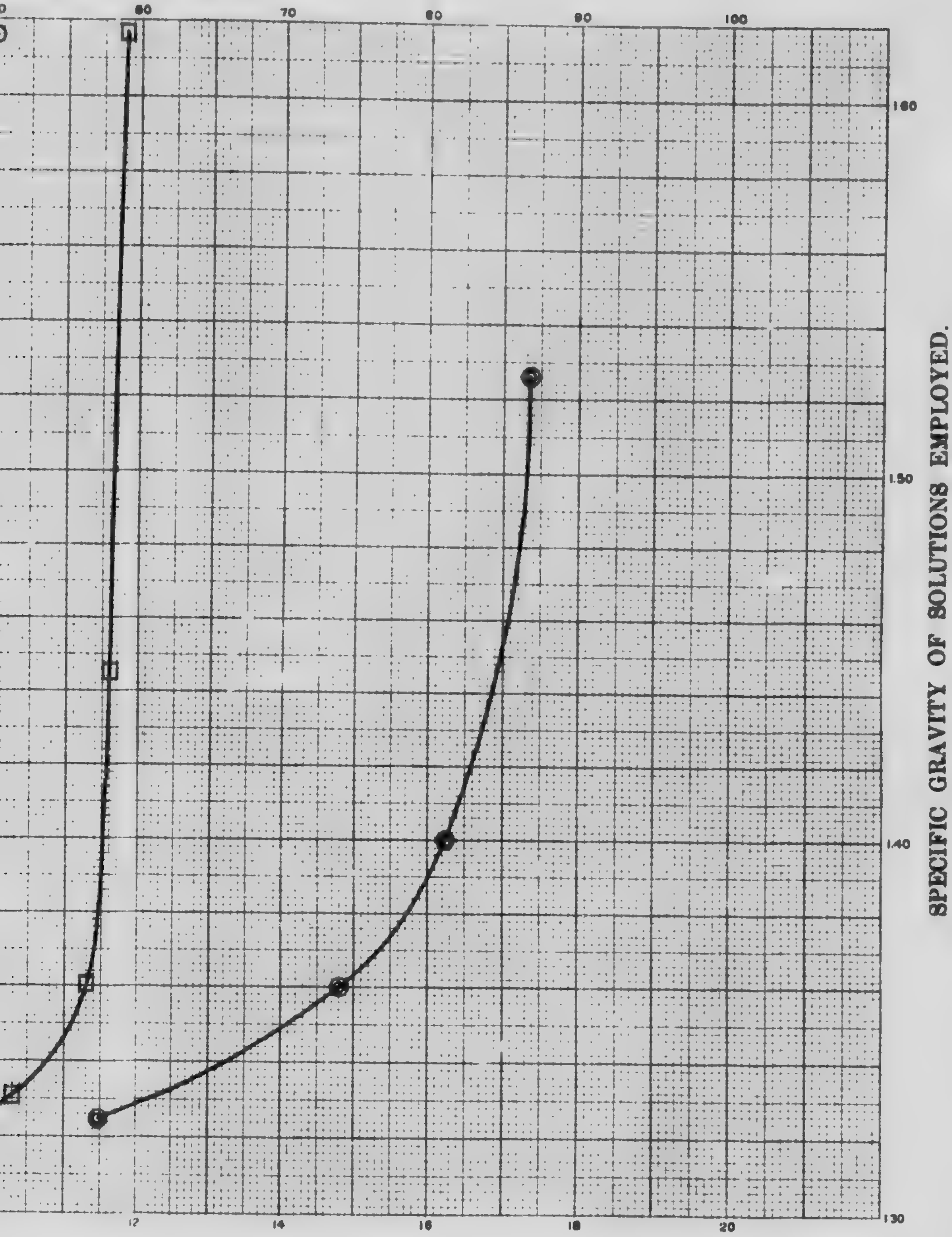


LEGEND: SYMBOLS.

○ Curve showing the relative quantities of the several sizes.
△ " " " " " " " " densities.
□ " " " percentage of ash in each of the several sizes.
● " " " " " " " material floating at the several densit

NG AND SPECIFIC GRAVITY TESTS.

OF SIZE AND OF FLOAT.



ASH IN SIZE AND IN FLOAT.

COAL No. 37
Appendix I, Vol. III

eral densities.

COAL.—No. 39.

Locality.—Lingan, N.S.

Colliery.—Dominion Coal Co. No. 12 mine, Lingan seam.

Sample.—This seam was being developed at the time it was sampled, and twenty-five sacks only were filled from a pile which had been drawn from the slope a few hours previously. There was no deliberate hand picking, but the larger lumps of refuse may have been thrown out underground. Sampled June 27, 1908. The mine has since been fully developed and is now producing a considerable tonnage.

TABLE A.

Specific Gravity Tests.

	Specific gravity of solution.	Float %	Ash in Float %	Sink %	Ash in Sink %
1.	1·540	94·5	2·3	5·5	49·1
2.	1·420	93·1	2·2	6·9	42·1
3.	1·370	90·8	2·2	9·2	30·4
4.	1·330	87·0	1·5	13·0	22·4

The following results are obtained from the above data, and the chemists results :—

5.	Good coal, Sp. Gr. under 1·375	% yield	91·0	% ash	2·2
6.	Bone coal, Sp. Gr. 1·375 to 1·55	" "	3·0	" "	5·0
7.	Useful coal—sum of (5) and (6)	" "	94·0	" "	2·3
8.	Refuse, Sp. Gr. over 1·55	" "	6·0	" "	50·0
9.	Assay of original sample raw coal as sent to chemist			" "	4·8
10.	" " " " " "			% sulphur	1·8
11.	" " " " " "			Fuel Ratio	1·55
12.	Assay of mixed good and bone coal (5) and (6)			" "	1·44

Remarks.—This coal carries a comparatively small amount of innate ash, and is also low in refuse, which itself is low in ash. As the sample is equivalent to unscreened, and almost unpicked run of mine, the ash may be considered very low for the district. The coal could be improved by washing, but this treatment is unnecessary under present conditions.

TABLE B.

Screen Analysis.

	Maximum Screen MM.	Minimum Screen MM.	Mean MM.	% of whole sample	% Ash in size
13.	6·34	3·16	4·75	61·9	4·5
14.	3·16	1·20	2·18	18·4	3·7
15.	1·20	0·64	0·92	9·3	4·6
16.	0·64	0·30	0·47	4·8	5·0
17.	0·30	0·173	0·24	3·4	5·0
18.	0·173	0·000	0·086	2·2	9·4

Remarks.—The coal makes very little fines, and is apparently less friable than any other coal from the district.

TABLE C.

Results of Washing (Details of Sizes).

	Original coal and its products	Sizes between 1" and ½" Total wt. lbs.	Ash %	Sizes between ½" and ¼" Total wt. lbs.	Ash %	Sizes under ¼" Total wt. lbs.	Ash %
19.	Original coal						
20.	Washed coal						
21.	Refuse—coarse	Not washed					
22	Hutch product						
23	Jig slimes						
24	Table slimes						

TABLE D.

Results of Washing (Totals).

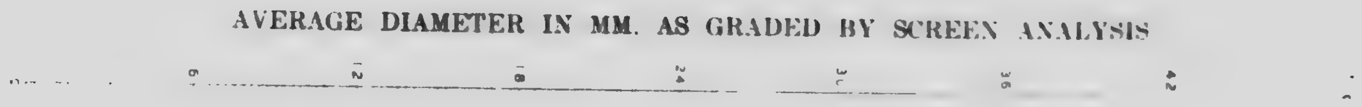
25.	Original coal	wt. in lbs.	% ash	% sulphur
26.	Washed coal	" "	" "	" "
27.	Refuse	" "	" "	" "
28.	Other products	" "	" "	" "
29.	Loss	" "	" "	" "
30.	Loss in %			

TABLE E.

Summary Statement of Effect of Washing on Fuel Values.

31.	Recovery of washed coal, including good bone	%	Ratio to standard
32.	Reduction in ash	%	" "
33.	" " sulphur	%	" "
34.	Increase in calorific value—calorimeter	%	
35.	Increase in evaporation under boiler	%	
36.	Decrease in clinker under boiler	%	
37.	Fuel ratio of original coal		
38	" " washed "		
39	Calorific value of original coal		
40.	" " washed "		

Remarks on Tables C, D, and E.—This coal was not washed on a large scale.


AVERAGE DIAMETER IN MM. AS GRADED BY SCREEN ANALYSIS
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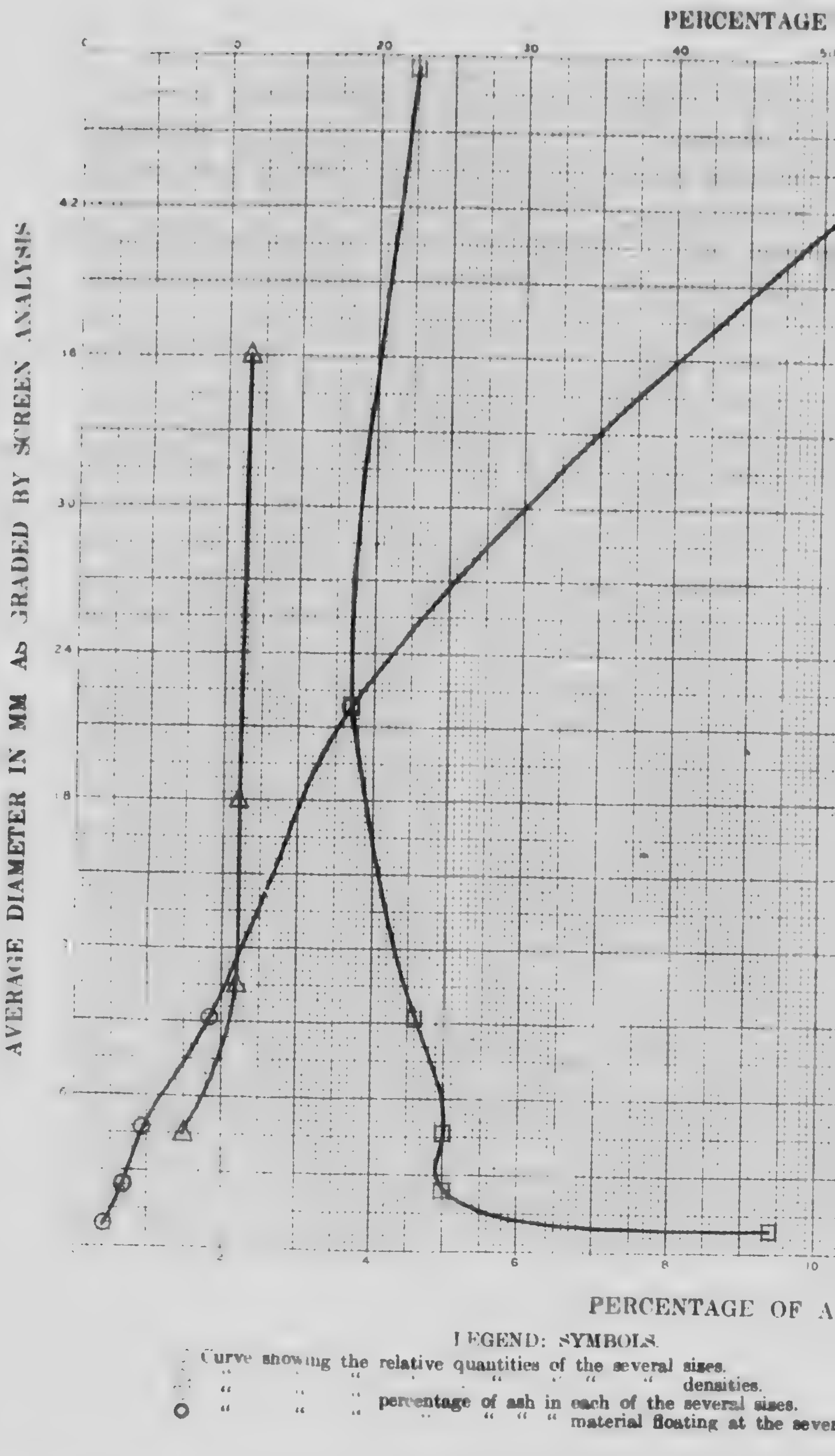
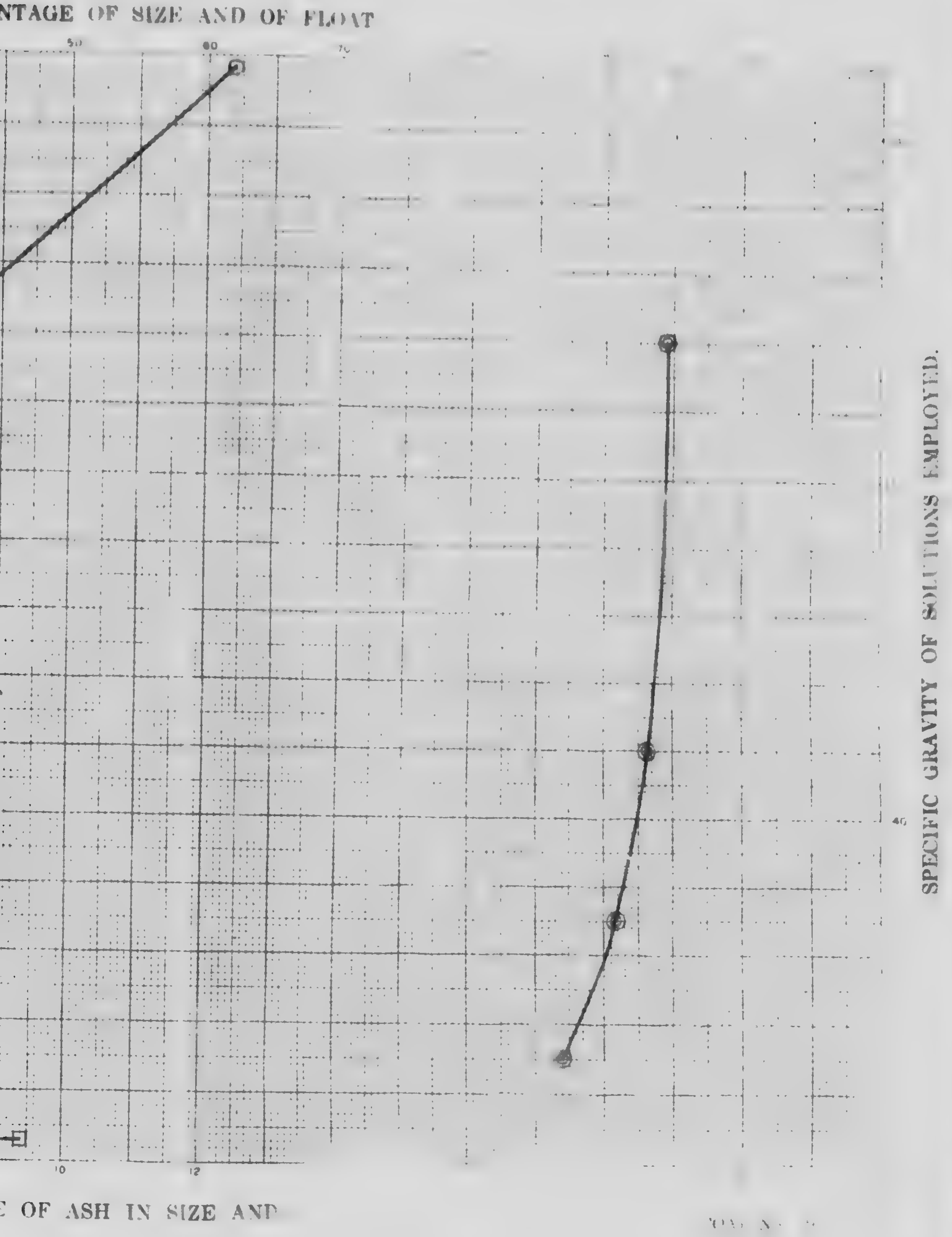
GRAPHIC RECORD OF SIZIN



SIZING AND SPECIFIC GRAVITY TESTS



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COAL.—No. 13.

Locality.—Sydney Mines, Cape Breton, N.S.

Colliery.—Nova Scotia Steel and Coal Co., No. 1 colliery, Main seam.

Sample.—Ten tons of lump coal were taken after it had been passed over a ⅞″ bar screen and had been hand picked. Sampled July 5, 1907.

TABLE A.

Specific Gravity Tests.

	Specific gravity of solution.	Float %	Ash in Float %	Sink %	Ash in Sink %
1.	1·560	91·0	2·3	9·0	61·7
2.	1·460	88·2	2·0	11·8	....
3.	1·375	87·0	1·9	13·0	49·2
4.	1·320	83·5	1·6	16·5	....

The following results are obtained from the above data, and the chemists results:—

5.	Good coal, Sp. Gr. under 1·375	% yield	87·0	% ash	1·8
6.	Bone coal, Sp. Gr. 1·375 to 1·55	" "	3·5	" "	12·2
7.	Useful coal—sum of (5) and (6)	" "	90·5	" "	2·3
8.	Refuse, Sp. Gr. over 1·55	" "	9·5	" "	61·6
9.	Assay of original sample raw coal as sent to chemist			" "	7·2
10.	" " " " " "			% sulphur	2·9
11.	" " " " " "			Fuel Ratio	1·48
12.	Assay of mixed good and bone coal (5) and (6)			" "	....

Remarks.—This coal is exceptionally low in innate ash for the district from which it comes, and the refuse, while comparatively small in amount, is high in ash. The sulphur, also, is largely removable. The coal is, therefore, quite suitable for washing. The lump coal is, however, pure enough as it stands and does not need treatment. The screenings are ordinarily higher in ash and wash well.

TABLE B.

Screen Analysis.

	Maximum Screen MM.	Minimum Screen MM.	Mean MM.	% of whole sample	% Ash in size
13.	6·34	3·16	4·75	....	....
14.	3·16	1·20	2·18	....	....
15.	1·20	0·64	0·92	....	....
16.	0·64	0·30	0·47	....	....
17.	0·30	0·173	0·24	....	....
18.	0·173	0·000	0·086	....	....

Remarks.—No screen analyses were made.

TABLE C.

Results of Washing (Details of Sizes).

	Original coal and its products.	Sizes between 1" and ½" Total wt. lbs.	Ash. %	Sizes between ½" and ¼" Total wt. lbs.	Ash. %	Sizes under ¼" Total wt. lbs.	Ash. %
19.	Original coal	3251	....	1322	6·4	400	10·5
20.	Washed coal	2917	4·0	1157	3·0	375	2·9
21.	Refuse—coarse	....	....	....	....	....	....
22.	Hutch product	....	....	....	....	....	....
23.	Jig slimes	....	....	....	....	....	....
24.	Table slimes	....	....	....	....	....	27·6

TABLE D.

Results of Washing (Totals).

25.	Original coal	wt. in lbs.	4973	% ash	7·2	% sulphur	2·9
26.	Washed coal	" "	4449	" "	3·5	" "	1·9
27.	Refuse	" "	343	" "	43·5	" "	....
28.	Other products	" "	60	" "	8·6	" "	....
29.	Loss	" "	121	" "	....	" "	....
30.	Loss in % 2·4						

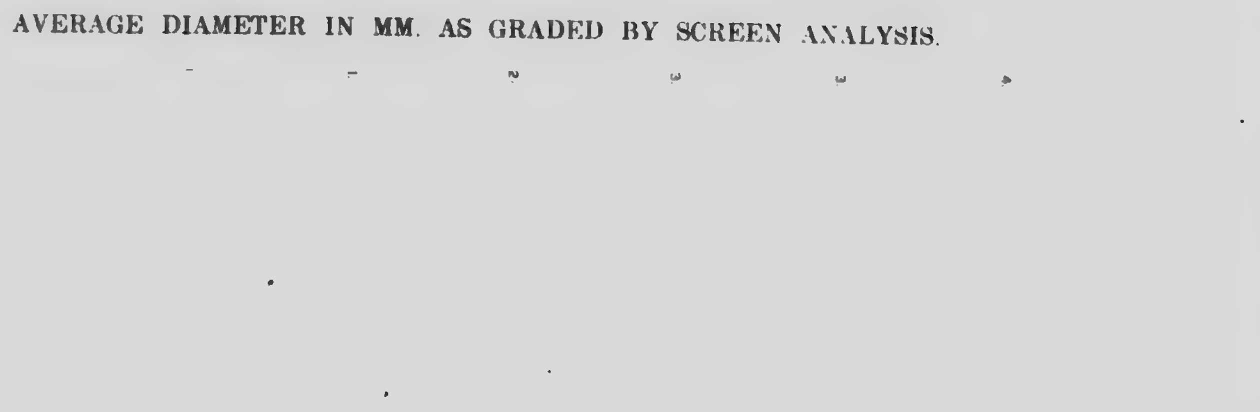
TABLE E.

Summary Statement of Effect of Washing on Fuel Values.

31.	Recovery of washed coal, including good bone	%	89·4	Ratio to standard	98·7
32	Reduction in ash	%	51·4	" "	65·7
33.	" " sulphur	%	34·5	" "	62·5
34.	Increase in calorific value—calorimeter	%	5·2		
35.	Increase in evaporation under boiler	%	4·8		
36.	Decrease in clinker under boiler	%	66·1		
37.	Fuel ratio of original coal		1·48		
38.	" " washed "		1·40		
39.	Calorific value of original coal		7650		
40.	" " washed "		8050		

Remarks on Tables C, D, and E.—The procedure adopted in washing was standard and the results of the trial compare very favourably with those of the specific gravity tests. It is also possible to compare these trials with the work of a washer operated by the Company at the mines; although the latter treats screenings only, which are, of course, higher in ash than the average coal. It is stated that these screenings contain 16 per cent of ash and 2·18 per cent of sulphur and produce washed coal of 4·5 per cent ash and 1·51 per cent sulphur, with a loss of about 22 per cent. These figures correspond remarkably well with the result of the trial which was made on coal containing 7·5 per cent of ash and 2·86 per cent of sulphu., and produced a coal containing 3·46 per cent ash and 1·93 per cent sulphur, although, of course, the trial gave a lower recovery of washed coal than would have been obtained by continuous operations.

Owing to the excellent quality of the raw coal, washing operations are not justified for fuel purposes, although they are for the production of coke from screenings, or probably from run of mine coal, if it were desirable to use it for this purpose.


AVERAGE DIAMETER IN MM. AS GRADED BY SCREEN ANALYSIS.
1.
2.
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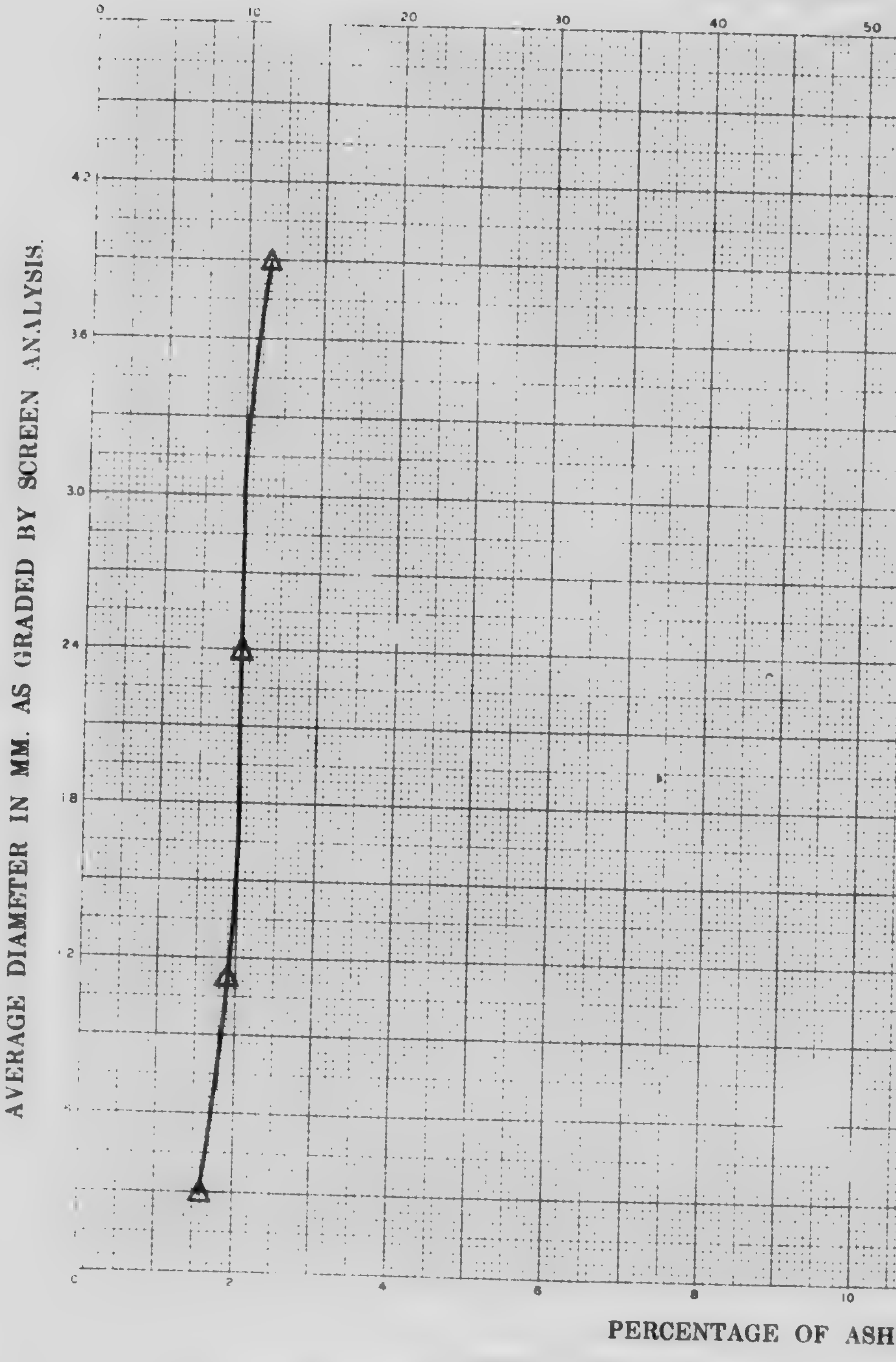
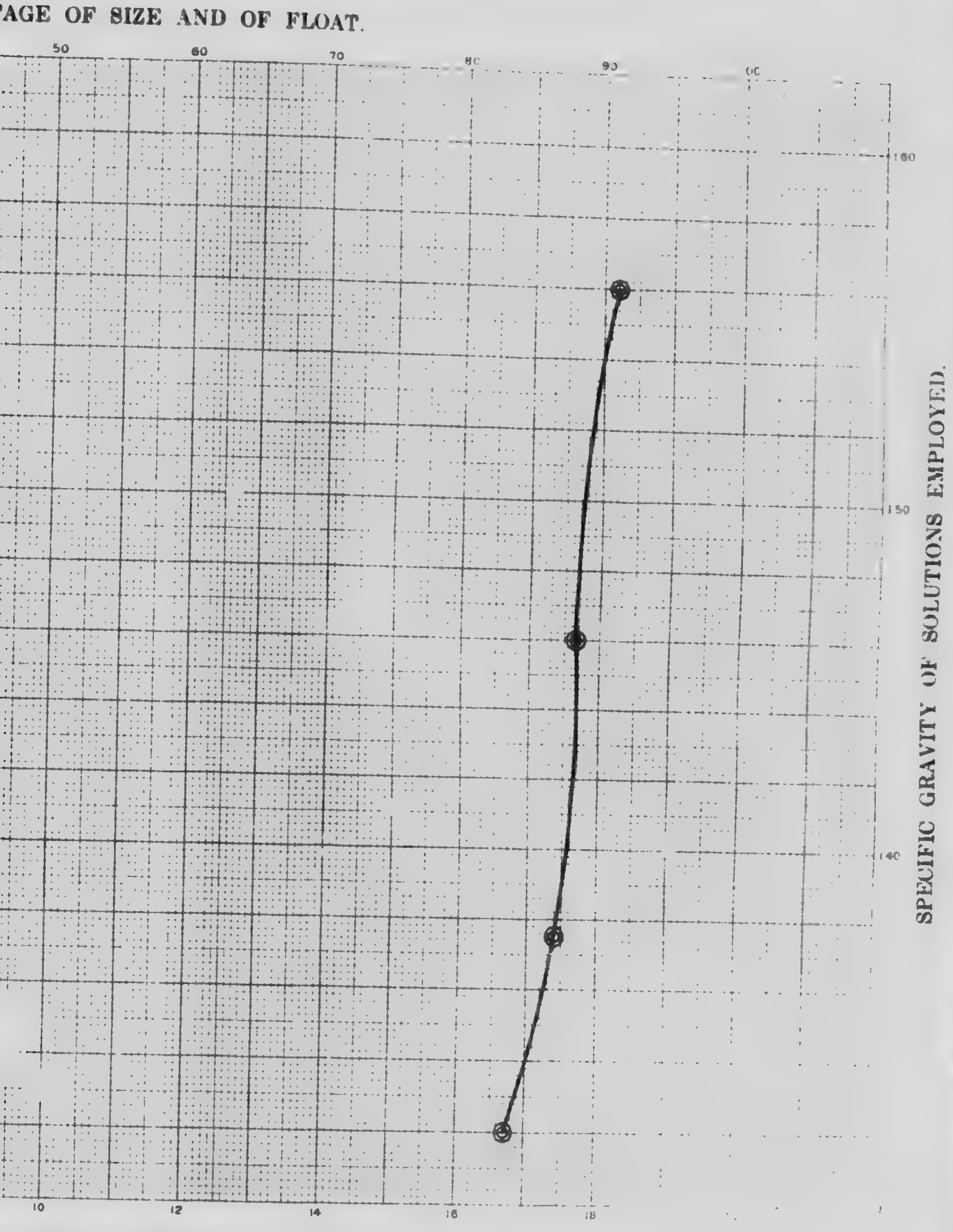
GRAPHIC RECORD OF SIZIN



LEGEND: SYMBOLS.

○ Curve showing the relative quantities of the several sizes.
△ " " " " " " " " densities.
□ " " " percentage of ash in each of the several sizes.
◉ " " " " " " " material floating at the several

SIZING AND SPECIFIC GRAVITY TESTS.



COAL No. 13
APPENDIX I, VOL. III

several densities.

COAL.—No. 12.

Locality.—Sydney Mines, C.B., N.S.

Colliery.—Nova Scotia Steel and Coal Co., Colliery No. 3.

Sample.—One hundred and fifty bags taken from the Sydney main seam in Sections 7, 8, 9, and 10, at distances of 3,200 to 5,000 feet from beginning of slope. Sample was lump coal which had been cleaned on a ½" screen and then hand picked. Sampled July 4, 1907.

TABLE A.

Specific Gravity Tests.

	Specific gravity of solution.	Float %	Ash in Float %	Sink %	Ash in Sink %
1.	1·545	93·8	3·2	6·2	56·5
2.	1·425	89·2	2·8	10·8	41·0
3.	1·375	88·0	2·4	12·0	34·1
4.	1·320	80·4	1·9	19·6	25·1

The following results are obtained from the above data, and the chemists results:—

5.	Good coal, Sp. Gr. under 1·375	% yield	88·0	% ash	2·4
6.	Bone coal, Sp. Gr. 1·375 to 1·55	" "	6·2	" "	16·1
7.	Useful coal—sum of (5) and (6)	" "	94·2	" "	3·3
8.	Refuse, Sp. Gr. over 1·55	" "	5·8	" "	58·5
9.	Assay of original sample raw coal as sent to chemist			" "	6·7
10.	" " " " " "			% sulphur	2·5
11.	" " " " " "			Fuel Ratio	1·39
12.	Assay of mixed good and bone coal (5) and (6)			" "	..

Remarks.—The innate ash is low. There is very little bone, and the refuse, while small in quantity, is high in ash. Washing would improve the coal considerably, but it is already good enough for practical purposes. Screenings from this coal could probably be commercially benefited by washing, especially if used for coking.

TABLE B.

Screen Analysis.

	Maximum Screen MM.	Minimum Screen MM.	Mean MM.	% of whole sample	% Ash in size
13.			..	...	
14.		.	.		
15.		..	.	...	.
16.					....
17.			.	...	.
18.		.	. .	...	. ..

TABLE C

Results of Washing (Details of Sizes).

	Original coal and its products.	Sizes between 1" and ½" Total wt. lbs.	Ash. %	Sizes between ½" and ¼" Total wt. lbs.	Ash. %	Sizes under ¼" Total wt. lbs.	Ash. %
19.	Original coal	Not washed					
20.	Washed coal						
21.	Refuse—coarse						
22.	Hutch product						
23.	Jig slimes						
24.	Table slimes						

TABLE D.

Results of Washing (Totals).

25. Original coal........................wt. in lbs. .... % ash ... % sulphur ....
26. Washed coal........... .... " " .... " " .... " " ....
27. Refuse.......... . ... " " ... " " .... " " ....
28. Other products....... .... " " ... " " .... " " ....
29. Loss.............................. " " .... " " .... " " ....
30. Loss in %

TABLE E.

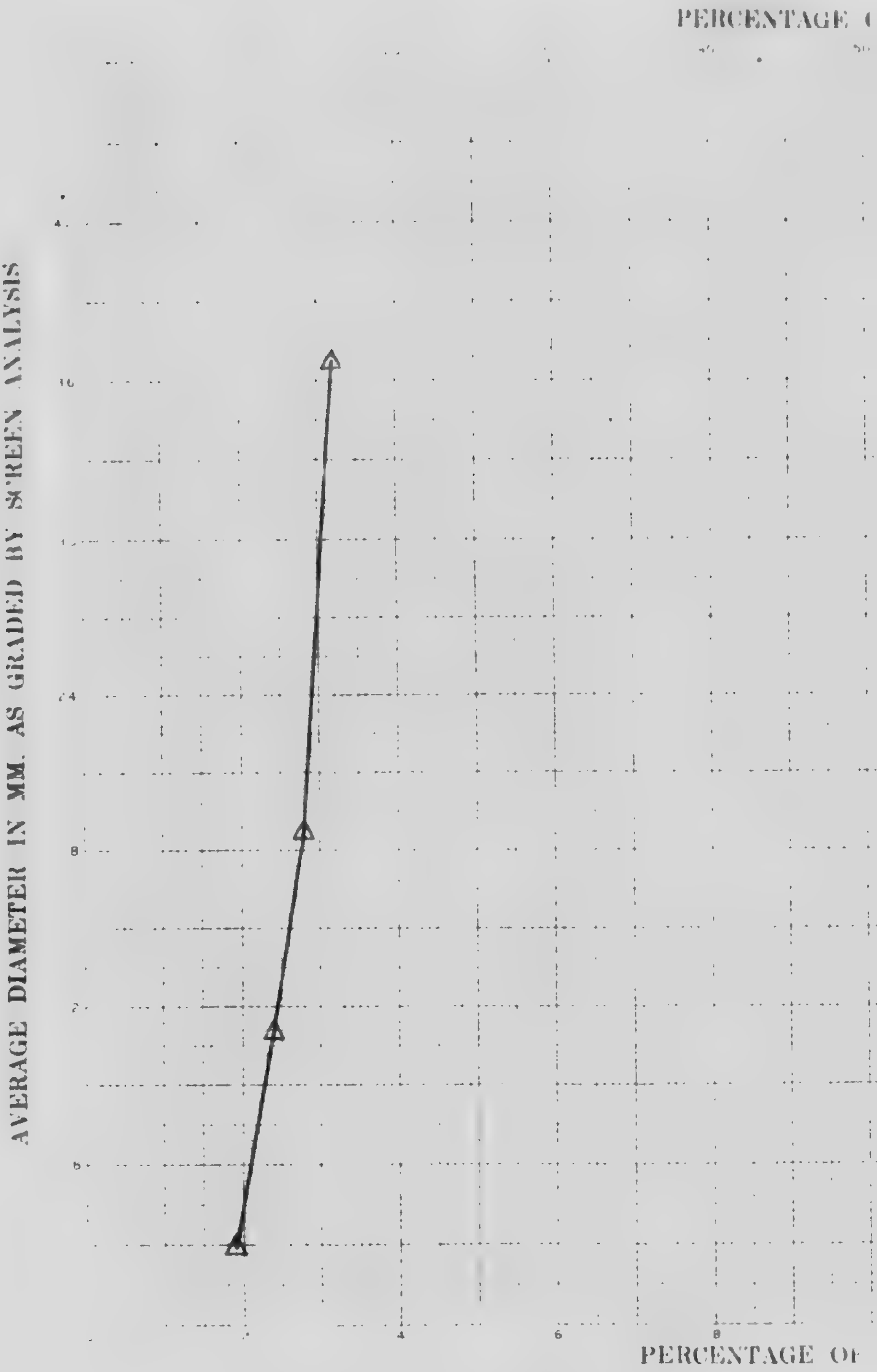
Summary Statement of Effect of Washing on Fuel Values.

31. Recovery of washed coal, including good bone....% .... Ratio to standard ....
32. Reduction in ash...........................% .... " ....
33. " " sulphur.........................% .... " " ....
34. Increase in calorific value—calorimeter.........%
35. Increase in evaporation under boiler...........% ..
36. Decrease in clinker under boiler..............% ....
37. Fuel ratio of original coal....
38. " " washed " ...
39. Calorific value of original coal
40. " " washed "

Remarks on Tables C, D, and E.—It was not considered necessary to wash this sample.

AVERAGE DIAMETER IN MM. AS GRADED BY SCREEN ANALYSIS
0
2.4

GRAPHIC RECORD OF SIZIN



LEGEND: SYMBOLS

○ Curve showing the relative quantities of the several sizes.
" " " " " " " " densities
" " percentage of ash in each of the several sizes.
" " " " " " " material floating at the sev

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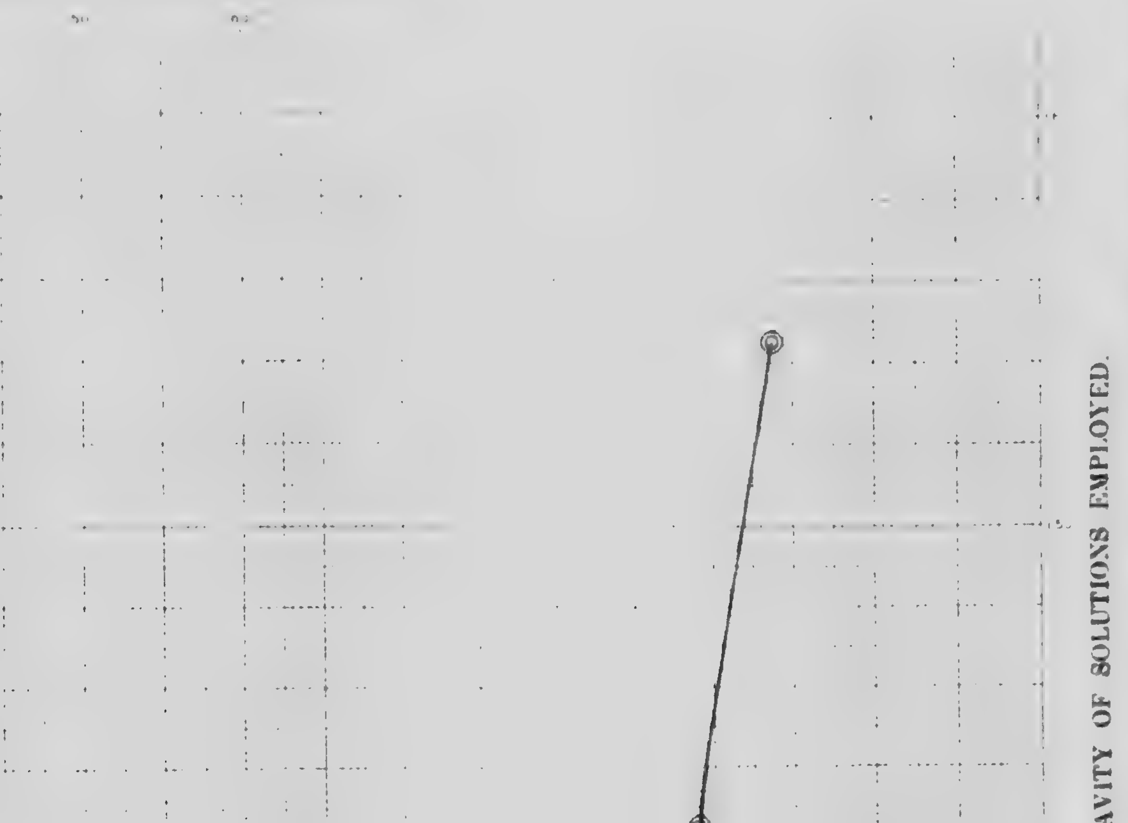


OAL No. 12
APPENDIX I, VOL. III

ties
al sizes.
at the several densities

INVERNESS COAL FIELD.

INVERNESS CO., NOVA SCOTIA.

ERRATUM

On the curve diagrams accompanying the tabulated records of each of the coals tested, is the following legend

LEGEND: SYMBOLS

○ Curve showing the relative quantities of the several sizes
△ " " " " " " " " " densities
□ " " " percentage of ash in each of the several sizes
● " " " " " " material floating at the several densities.

The above legend is incorrect; in each case it should read thus:—

Curve showing the relative quantities of the several sizes
" " " percentage of ash in each of the several sizes
○ " " " material floating at the several densities.
△ " " " " ash in " " " " " "

COAL.—No. 14.

Locality.—**Inverness, Inverness county, N.S.**

Colliery.—**Inverness Coal and Railway Co., Inverness colliery.**

Sample.—Ten tons were taken from levels 5, 6, and 7. The sample consisted of lump coal which had been passed over a $\frac{5}{8}''$ shaking screen and then hand picked. Sampled July 12 and 15, 1907.

TABLE A.

Specific Gravity Tests.

	Specific gravity of solution.	Float %	Ash in Float %	Sink %	Ash in Sink %
1.	1·540	84·5	5·5	15·5	43·4
2.	1·455	77·0	4·5	23·0	....
3.	1·370	64·0	3·6	36·0	22·7
4.	1·310	17·0	3·1	83·0	11·5

The following results are obtained from the above data, and the chemists results:—

5.	Good coal, Sp. Gr. under 1·375	% yield	65·0	% ash	3·6
6.	Bone coal, Sp. Gr. 1·375 to 1·55	" "	20·0	" "	11·7
7.	Useful coal—sum of (5) and (6)	" "	85·0	" "	5·6
8.	Refuse, Sp. Gr. over 1·55	" "	15·0	" "	39·1
9.	Assay of original sample raw coal as sent to chemist			" "	10·4
10.	" " " " " "			% sulphur	5·0
11.	" " " " " "			Fuel Ratio	1·24
12.	Assay of mixed good and bone coal (5) and (6)			" "	. . .

Remarks.—This coal contains a comparatively small proportion of innate ash, a large proportion of bone coal, low in ash, and a considerable proportion of refuse, very low in ash. The sulphur is very high. The coal can be considerably improved, both as regards ash and sulphur, by washing, but it is a very difficult material to treat, owing to its physical characteristics and the peculiar distribution of the sulphur, which is largely in thin scales.

TABLE B.

Screen Analysis.

	Maximum Screen MM.	Minimum Screen MM.	Mean MM.	% of whole sample	% Ash in size
13.	6·34	3·16	4·75		
14.	3·16	1·20	2·18		
15.	1·20	0·64	0·92		
16.	0·64	0·30	0·47		
17.	0·30	0·173	0·24		
18.	0·173	0·000	0·086		

Remarks.—No screen analyses were made.

TABLE C.

Results of Washing (Details of Sizes).

	Original coal and its products	Sizes between 1" and ½" Total wt. lbs	Ash %	Sizes between ½" and ⅛" Total wt. lbs.	Ash %	Sizes under ⅛" Total wt. lbs.	Ash %
19.	Original coal	3519	9·2	1216	8·2	380	13·7
20.	Washed coal	3143	6·4	1063	5·3	234	5·7
21.	Refuse—coarse	.	....	....	....	....	....
22.	Hutch product	.	....	....	....	...	27·6
23.	Jig slimes			....	....	..	.
24.	Table slimes			....	.	.	.

TABLE D.

Results of Washing (Totals).

25.	Original coal	wt. in lbs.	5115	% ash	10·4	% sulphur	6·0
26.	Washed coal	" "	4440	" "	6·5	" "	5·0
27.	Refuse	" "	603	" "	34·4	" "	....
28.	Other products	" "	80	" "	8·0	" "	....
29.	Loss	" "	8	" "	....	" "	....
30	Loss in % 0·0.						

TABLE E.

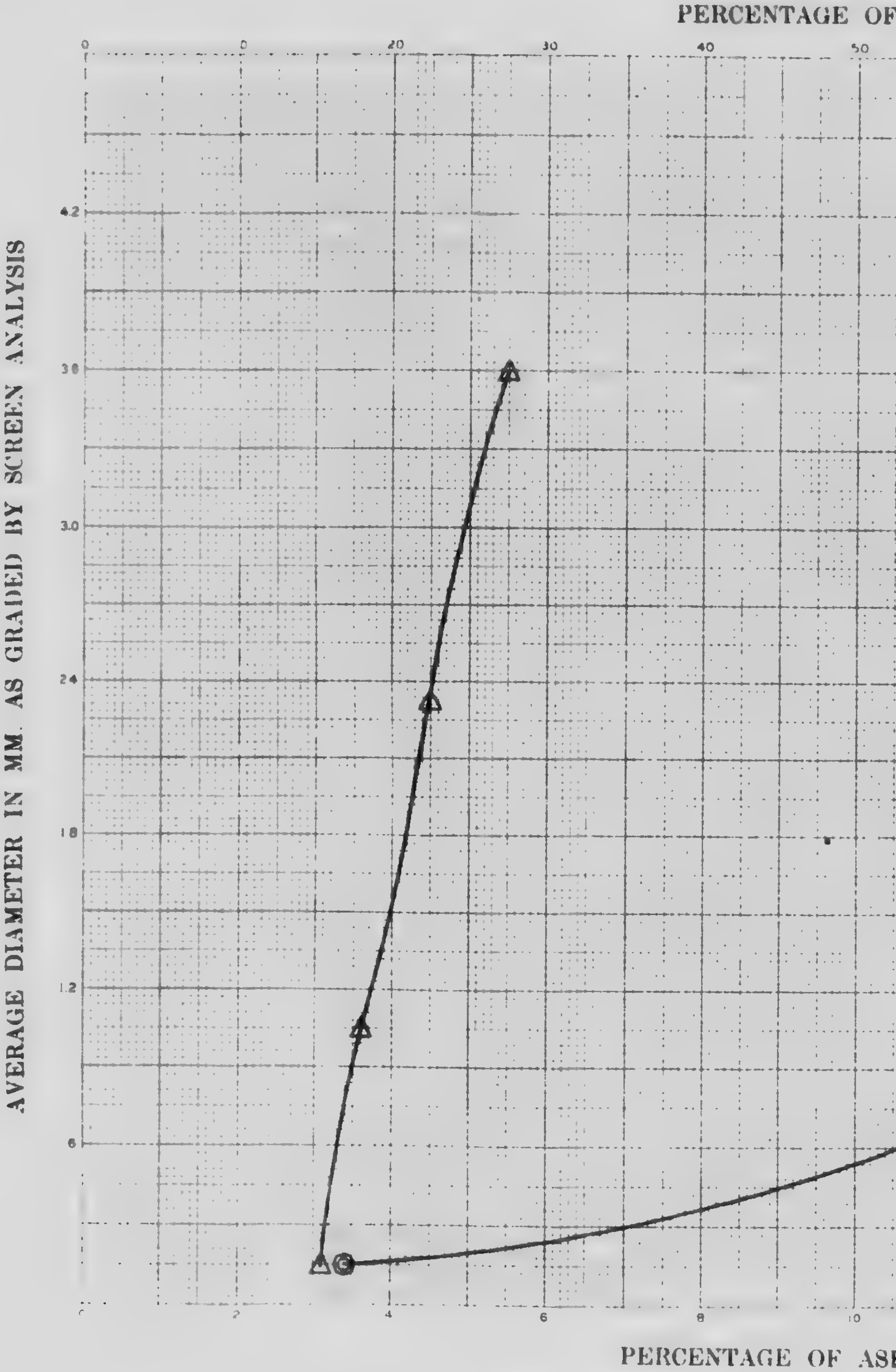
Summary Statement of Effect of Washing on Fuel Values.

31.	Recovery of washed coal, including good bone.	%	86·7	Ratio to standard	102·0
32.	Reduction in ash	%	37·5	" "	86·1
33.	" " sulphur.	%	16·7	" "	62·5
34.	Increase in calorific value—calorimeter	%	5·3		
35.	Increase in evaporation under boiler.	%	5·9		
36.	Decrease in clinker under boiler.	%	56·9		
37.	Fuel ratio of original coal..		1·24		
38.	" " washed "		1·20		
39.	Calorific value of original coal.		6750		
40.	" " washed "		7110		

Remarks on Tables C. D. and E.—The procedure in washing was standard, and the results of the trial compare very well with those of the specific gravity determinations, although the recovery of washed coal is lower and the waste in refuse higher than would be the case in a continuous commercial operation. The coal is unsuitable for coke on account of its high organic sulphur, and the improvement in steaming qualities is not sufficient to justify washing for fuel purposes, particularly as the raw coal itself is not very high in ash.

AVERAGE DIAMETER IN MM AS GRADED BY SCREEN ANALYSIS
42
36
.4
8
.2
6

GRAPHIC RECORD OF SIZIN

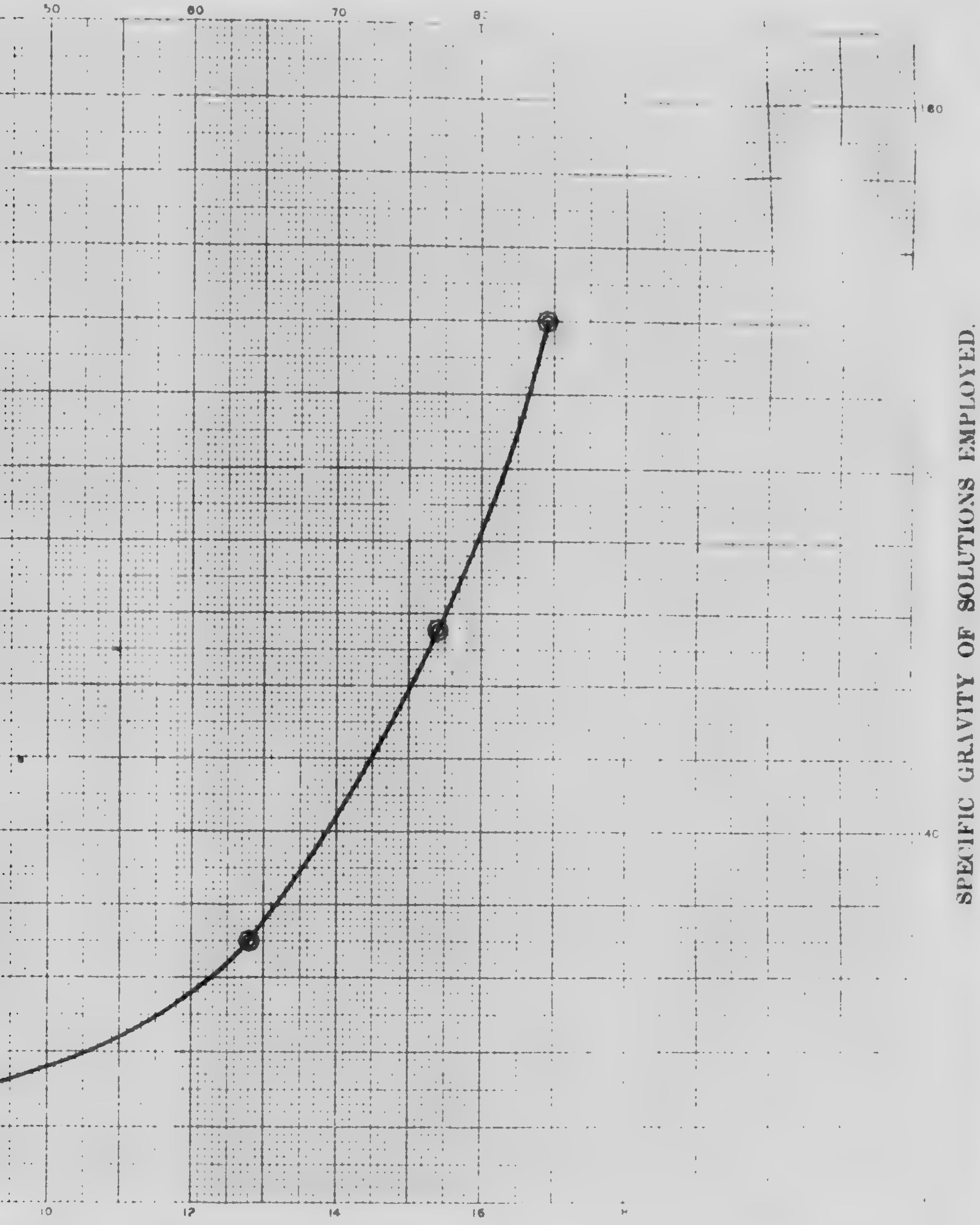


LEGEND: SYMBOLS.

○ Curve showing the relative quantities of the several sizes.
△ " " " " " " " " densities.
□ " " " percentage of ash in each of the several sizes.
◉ " " " " " " material floating at the several

SIZING AND SPECIFIC GRAVITY TESTS

AGE OF SIZE AND OF FLOAT.



OF ASH IN SIZE AND IN FLOAT.

COAL No. 14
APPENDIX I. VOL. III

ges.
he several densities

COAL—No. 15.

Locality.—Port Hood, Inverness county, N.S.

Colliery.—Richmond Railway and Coal Co., Port Hood colliery.

Sample.—Ten tons were taken from the 1,400 ft. and the 1,900 ft. levels, from which the major part of the output of the mine was at that time being drawn. The sample consisted of lump coal which had been passed over a ¾" screen and then hand picked. Sampled July 15, 1907.

TABLE A.

Specific Gravity Tests.

	Specific gravity of solution.	Float %	Ash in Float %	Sink %	Ash in Sink %
1.	1·520	76·0	7·8	24·0	36·4
2.	1·435	63·5	6·1	36·5	...
3.	1 375	38·0	4·85	62·0	20·5
4.	1·325	20·3	4·2	79·7	.

The following results are obtained from the above data, and the chemists results:—

5.	Good coal, Sp. Gr. under 1.375	% yield	38·0	% ash	4·9
6.	Bone coal, Sp. Gr. 1·375 to 1·55	" "	40·0	" "	12·0
7.	Useful coal—sum of (5) and (6)	" "	78·0	" "	8·3
8.	Refuse, Sp. Gr. over 1·55	" "	22·0	" "	36·5
9.	Assay of original sample raw coal as sent to chemist			" "	14·6
10.	" " " " " "			% sulphur	7·9
11.	" " " " " "			Fuel Ratio	1·30
12.	Assay of mixed good and bone coal (5) and (6)			" "	...

Remarks.—This coal has a moderate proportion of innate ash, a very large proportion of bone coal, low in ash, and a large proportion of refuse, very low in ash. The sulphur is very high and cannot be largely reduced, and while the ash can be considerably lowered by washing the coal is difficult to treat.

TABLE B.

Screen Analysis.

	Maximum Screen MM.	Minimum Screen MM.	Mean MM.	% of whole sample	% Ash in size
13.	6·34	3·16	4·75		
14.	3·16	1·20	2·18		.
15.	1·20	0·64	0·92		
16.	0·64	0·30	0·47		.
17.	0·30	0·173	0·24		. .
18.	0·173	0·000	0·086		

Remarks.—No screen analyses were made.

TABLE C

Results of Washing (Details of Sizes).

	Original coal and its products	Sizes between 1" and ½" Total wt. lbs.	Ash. %	Sizes between ½" and ¼" Total wt. lbs.	Ash. %	Sizes under ¼" Total wt. lbs.	Ash. %
19	Original coal	4158	14·9	1169	13·7	540	16·4
20.	Washed coal	3009	10·3	1007	9·4	398	9·9
21.	Refuse—coarse						
22.	Hutch product						36·2
23	Jig slimes						
24	Table slimes						

TABLE D

Results of Washing (Totals).

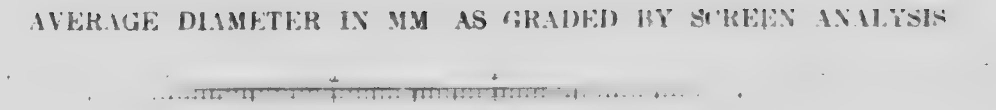
25.	Original coal	wt. in lbs	5847	% ash	14·6	% sulphur	7·9
26.	Washed coal	" "	4414	" "	10·9	" "	6·7
27.	Refuse	" "	1336	" "	26·8	" "	
28.	Other products	" "	35	" "	12·3	" "	
29.	Loss	" "	62	" "		" "	
30.	Loss in % 1·6						

TABLE E.

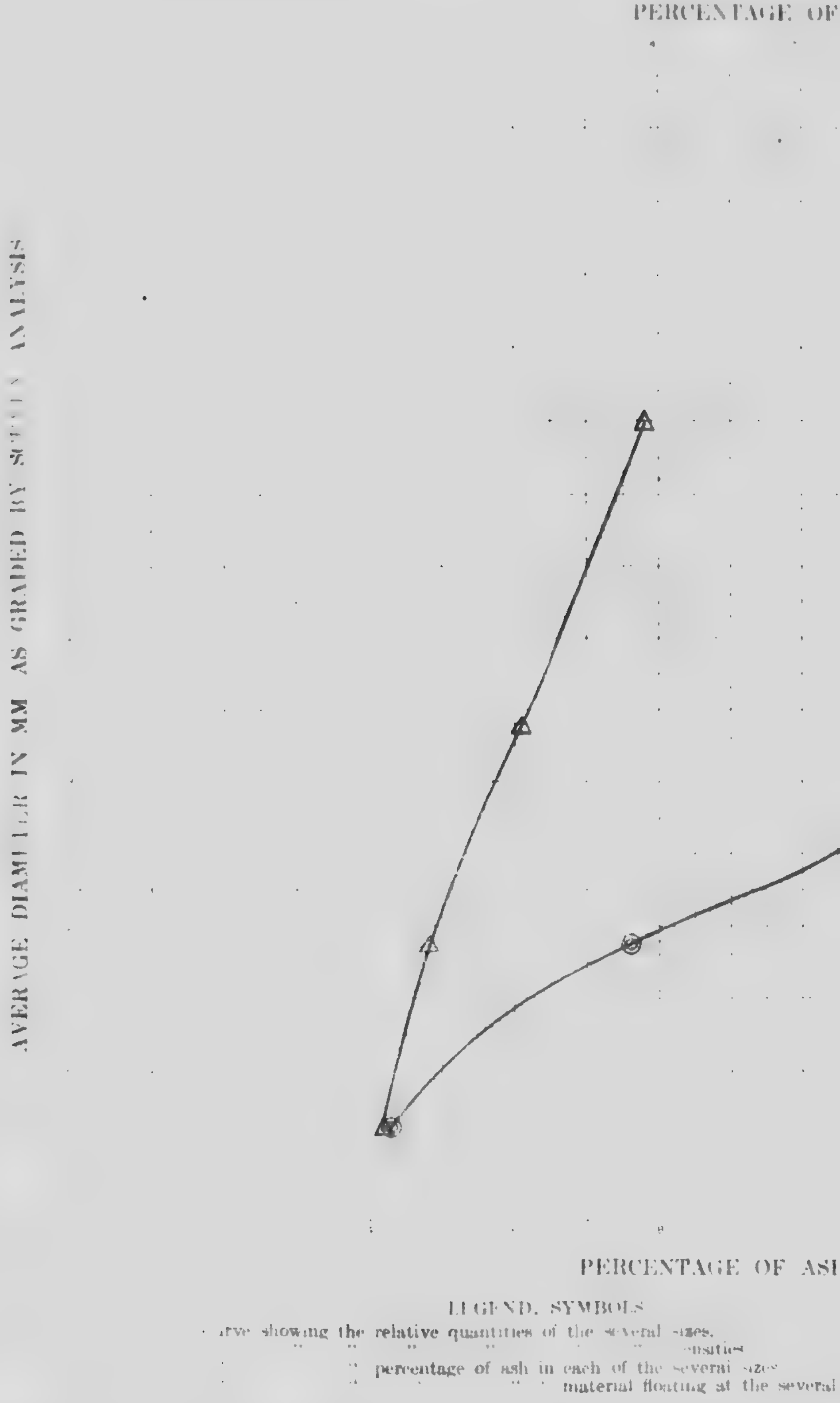
Summary Statement of Effect of Washing on Fuel Values.

31.	Recovery of washed coal, including good bone	%	75·5	Ratio to standard	96·8
32.	Reduction in ash	%	25·4	" "	76·1
33.	" " sulphur	%	15·2	" "	60·0
34.	Increase in calorific value—calorimeter	%	6·6		
35.	Increase in evaporation under boiler	%	5·8		
36	Decrease in clinker under boiler	%	39·4		
37.	Fuel ratio of original coal		1·30		
38.	" " washed "		1·35		
39.	Calorific value of original coal		6540		
40.	" " washed "		6970		

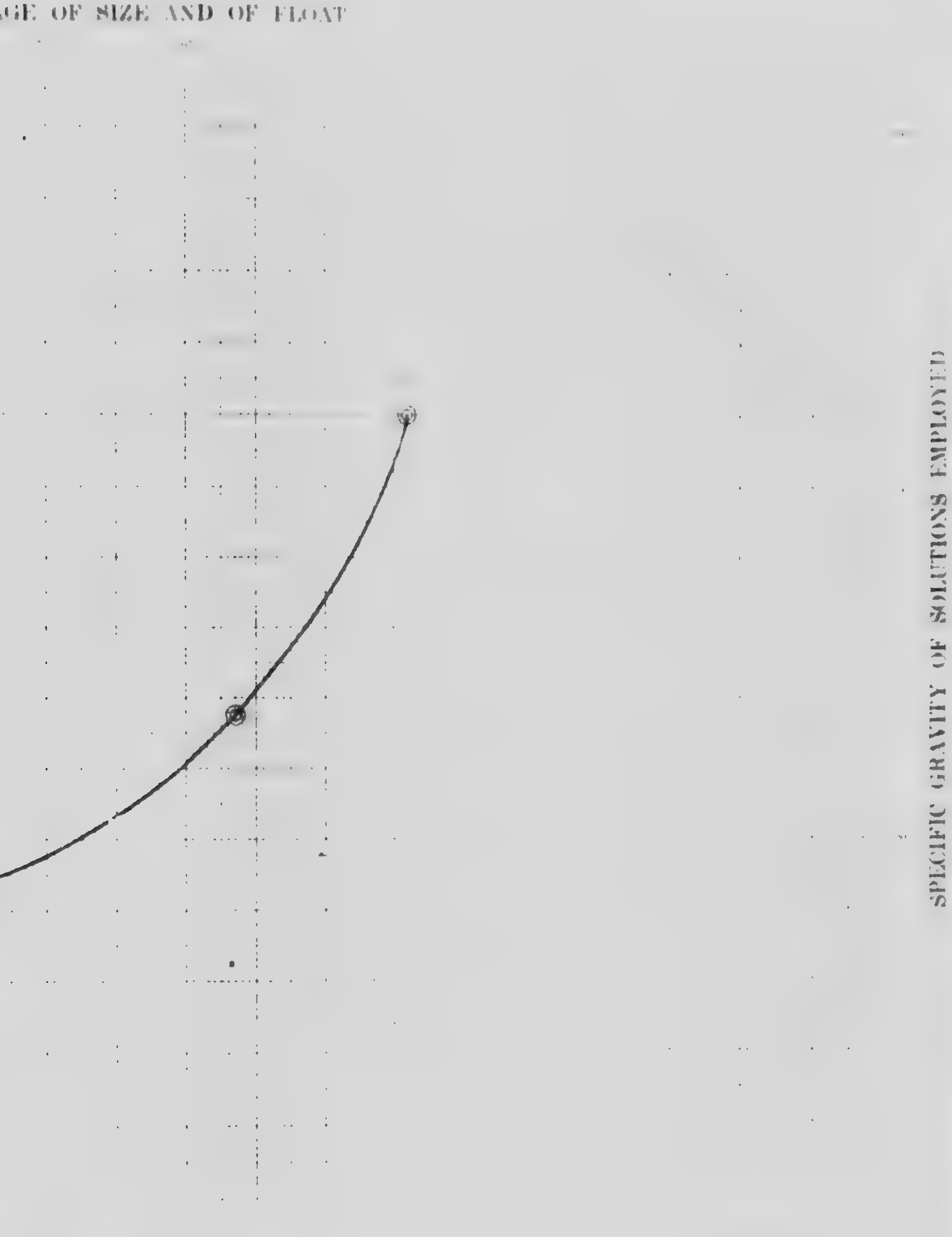
Remarks on Tables C, D, and E. The procedure in washing was standard and the results compare fairly well with those of the specific gravity tests, although the recovery of washed coal is lower than would be the case in a continuous commercial operation. The standard for refuse is probably a little high in this case, but as the coal is unsuitable for coking, and washing does not very greatly increase its steaming powers, it is unlikely that washing would be commercially justifiable.


AVERAGE DIAMETER IN MM AS GRADED BY SCREEN ANALYSIS

GRAPHIC RECORD OF SIZIN



IZING AND SPECIFIC GRAVITY [illegible]



COAL No. [illegible]
Appendix I, Vol. III

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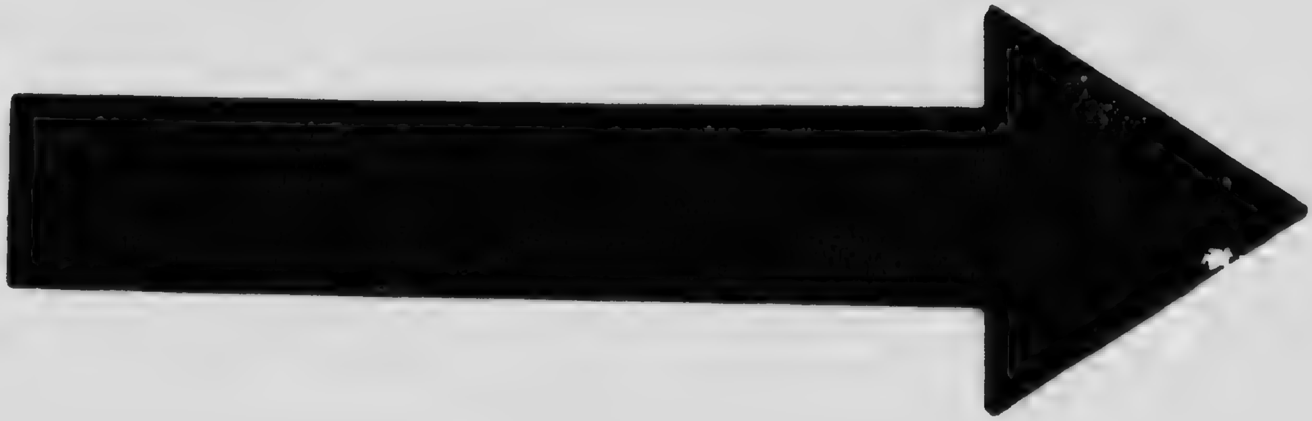
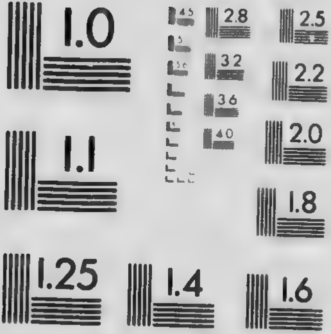


MICROCOPY RESOLUTION TEST CHART

(ANSI and ISO TEST CHART No. 2)



APPLIED IMAGE Inc

[illegible] Main Street
Rochester, New York [illegible] USA
[illegible]
[illegible]

PICTOU COAL FIELD.

PICTOU CO., NOVA SCOTIA.

ERRATUM

On the curve diagrams accompanying the tabulated records of each of the coals tested, is the following legend:—

LEGEND: SYMBOLS

Curve showing the relative quantities of the several sizes
" " " " " " " " densities
" " percentage of ash in each of the several sizes
" " " " " " material floating at the several densities

The above legend is incorrect; in each case it should read thus:—

Curve showing the relative quantities of the several sizes
" " " " percentage of ash in each of the several sizes
" " " " " material floating at the several densities
" " " " ash in " " " " "

COAL.—No. 4.

Locality.—Thorburn, Pictou county, N.S.

Colliery.—Acadia Coal Company, Vale colliery, Six Foot seam.

Sample.—Six tons were taken from the Six Foot seam. The sample was passed over a ¾″ screen and then hand picked. Sampled March 25, 1907

TABLE A.

Specific Gravity Tests.

	Specific gravity of solution.	Float %	Ash in Float %	Sink %	Ash in Sink %
1.	1·52	84·7	10·2	15·3	55·4
2.	1·44	77·4	9·5	22·6	45·3
3.	1·375	64·8	8·7	35·2	33·8
4.	1·31	27·6	7·9	72·4	....

The following results are obtained from the above data, and the chemists results :—

5.	Good coal Sp. Gr. under 1·375	% yield	64·6	% ash	8·7
6.	Bone coal, Sp. Gr. 1·375 to 1·55	" "	21·9	" "	15·5
7.	Useful coal—sum of (5) and (6)	" "	86·5	" "	10·5
8.	Refuse, Sp. Gr. over 1·55	" "	13·5	" "	56·8
9.	Assay of original sample raw coal as sent to chemist			" "	17·3
10.	" " " " " "			% sulphur	1·0
11.	" " " " " "			Fuel Ratio	1·57
12.	Assay of mixed good and bone coal (5) and (6)			" "	....

Remarks.—This coal has a high proportion of innate ash, a large proportion of bone, rather low in ash, and a considerable proportion of refuse proper. The ash should be considerably reduced by careful washing, although the coal is, apparently, a somewhat difficult one to treat. The sulphur is already comparatively low.

TABLE B.

Screen Analysis.

	Maximum Screen MM.	Minimum Screen MM.	Mean MM.	% of whole sample	% Ash in size.
13.	6·34	3·16	4·75	...	....
14.	3·16	1·20	2·18	...	...
15.	1·20	0·64	0·92	.	.
16.	0·64	0·30	0·47	...	....
17.	0·30	0·173	0·24	....	....
18.	0·173	0·000	0·086	.	....

Remarks. No screen analyses were made.

TABLE C.

Results of Washing (Details of Sizes).

	Original coal and products	Sizes between 1" and ½" Total wt. lbs.	Ash %	Sizes between ½" and ⅛" Total wt. lbs.	Ash %	Sizes under ⅛" Total wt. lbs.	Ash %
19.	Original coal		16·8		15·4	.	18·2
20.	Washed coal	2943	13·9	1408*			
21.	[illegible]						
22.	[illegible]						
23.	[illegible]						
24.	[illegible]						

TABLE D.

Results of Washing (Totals).

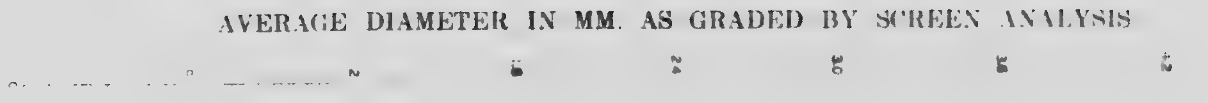
25.	Original coal	wt. in lbs. 5280	% ash 17·3	% sulphur	1·0
26.	Washed coal	" " 4351	" " 12·6	" "	1·0
27.	Refuse..	" " 762	" " 58·3	" "	
28.	Other products	" " 67	" " 18·4	" "	
29.	Loss ...	" " 100	" " ...	" "	
30.	Loss in % 1·9				

TABLE E.

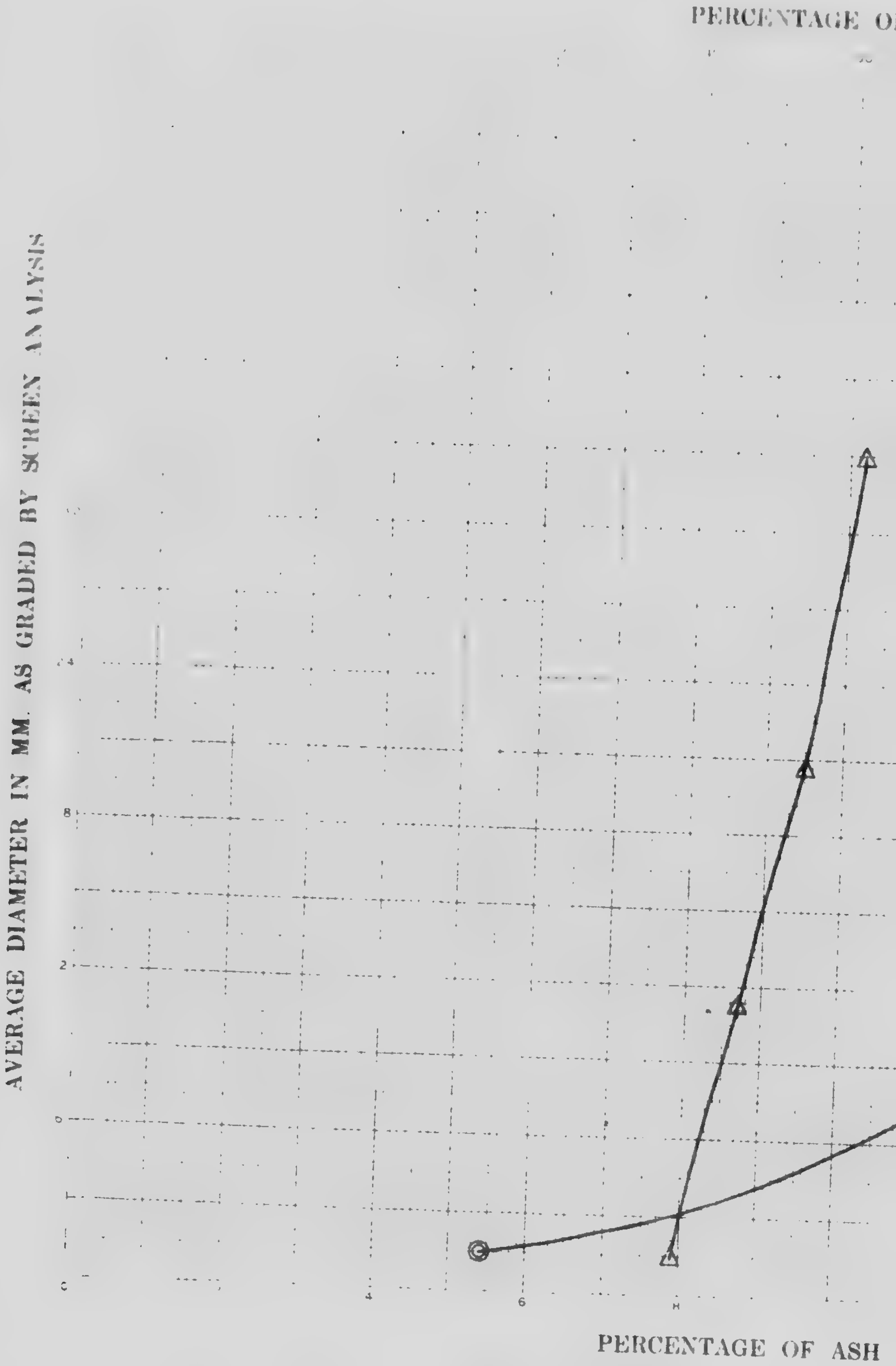
Summary Statement of Effect of Washing on Fuel Values.

31.	Recovery of washed coal, including good bone. . %	82·5	Ratio to standard	95·4
32.	Reduction in ash. %	27·2	" "	83·3
33.	" " sulphur . . . . %	0·0	" "	
34.	Increase in calorific value—calorimeter. . . . . . %	6·1		
35.	Increase in evaporation under boiler. . . . . . %	4·2		
36.	Decrease in clinker under boiler. . . . . %	33·4		
37.	Fuel ratio of original coal.	1·57		
38.	" " washed "	1·63		
39.	Calorific value of original coal.	6680		
40.	" " washed "	7090		

Remarks on Tables C, D, and E.—The procedure in washing was normal, although the tabulated results show that two sizes, which were separately washed, were weighed together. The results of the washing tests compare very well with the specific gravity determinations, although the recovery is less and the loss is greater than would be the case in a commercial operation.


AVERAGE DIAMETER IN MM. AS GRADED BY SCREEN ANALYSIS
1.2
1.8
2.4
3.0
3.6
4.2

GRAPHIC RECORD OF SIZIN

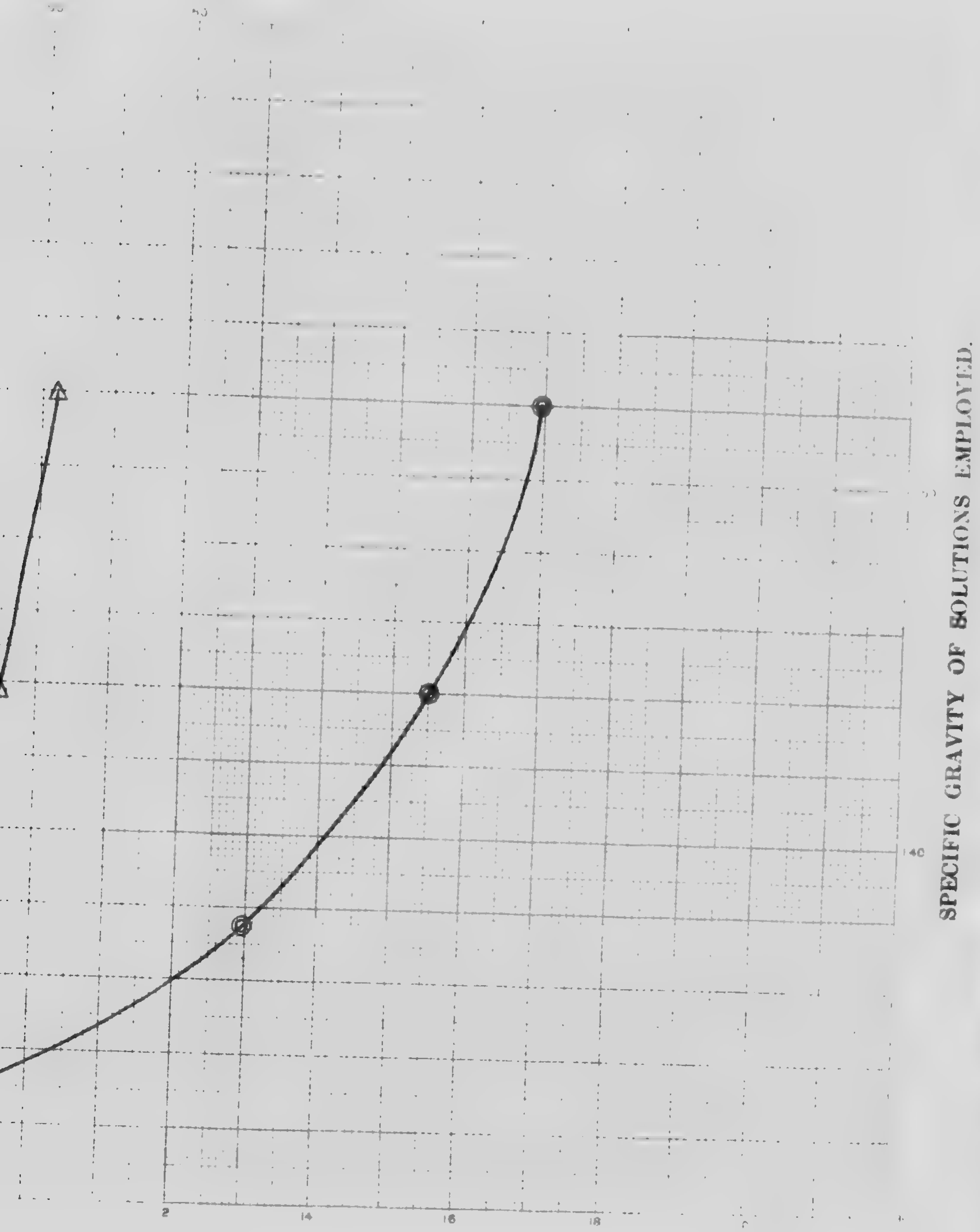


LEGEND: SYMBOLS.

○ Curve showing the relative quantities of the several sizes.
△ " " " " " " " densities.
□ " " " percentage of ash in each of the several sizes.
⊙ " " " " " " material floating at the several de

SIZING AND SPECIFIC GRAVITY TESTS

AGE OF SIZE AND OF FLOAT



F ASH IN SIZE AND IN FLOAT.

COAL No. 4
APPENDIX I. VOL. III

.
several densities.

COAL No. 16

[illegible] Pictou county, N.S.

[illegible] Acadia Coal Co., Allan Shaft colliery.

Sample.—One hundred and fifty bags from top bench of Foord seam on east sinking 500 feet from bottom of shaft. Sample was run of mine which had been hand picked. Sampled July 20, 1907.

TABLE A

Specific Gravity Tests.

	Specific gravity of solution.	Float %	Ash in Float %	Sink %	Ash in Sink %
1.	1·542	95·4	8·4	4·6	52·0
2.	1·423	91·5	8·1	8·5	36·8
3.	1·370	82·3	7·1	17·7	26·8
4.	1·325	51·1	5·2	48·9	16·6

The following results are obtained from the above data, and from the chemists' reports:—

5.	Good coal, Sp. Gr. under 1·375	% yield 83·7 % ash	7·2
6.	Bone coal, Sp. Gr. 1·375 to 1·55	" " 11·8 " "	16·9
7.	Useful coal—sum of (5) and (6)	" " 95·5 " "	8·4
8.	Refuse, Sp. Gr. over 1·55	" " 4·5 " "	57·4
9.	Assay of original sample raw coal as sent to chemist	" "	11·3
10.	" " " " " "	% sulphur	0·6
11.	" " " " " "	Fuel Ratio	1·66
12.	Assay of mixed good and bone coal (5) and (6)	" "	

Remarks.—This coal is high in innate ash and contains a moderate amount of average bone. The refuse is low in amount and rather high in ash. Washing would improve it appreciably, especially if the dividing line between bone and refuse were lowered below the standard adopted for these trials. It cannot, however, be very greatly improved as the innate ash is too high.

TABLE B

Screen Analysis.

	Maximum Screen MM	Minimum Screen MM	Mean MM	% of whole sample	% Ash in size.
13.					
14.					
15.					
16.					
17.					
18.					

TABLE C.

Results of Washing. (Details of Sizes)

Original coal and its products	Between [illegible] and [illegible] Total wt. [illegible]	Ash %	[illegible] and [illegible] Total wt. lbs.	Ash %	Size under ¼" Total wt lbs.
19. Original coal					
20. Washed coal					
21. Refuse—coarse	This coal was not washed.				
22. Hutch product					
23. Jig slimes					
24. Table slimes					

TABLE D.

Results of Washing (Totals).

25. Original coal . . . . wt. in lbs. % ash . . . . % sulphur
26. Washed coal . . . . " " " " . . . . " "
27. Refuse . . . . " " " " . . . . " "
28. Other products . . . . " " " " . . . . " "
29. Loss. . . .
30. Loss in %

TABLE E

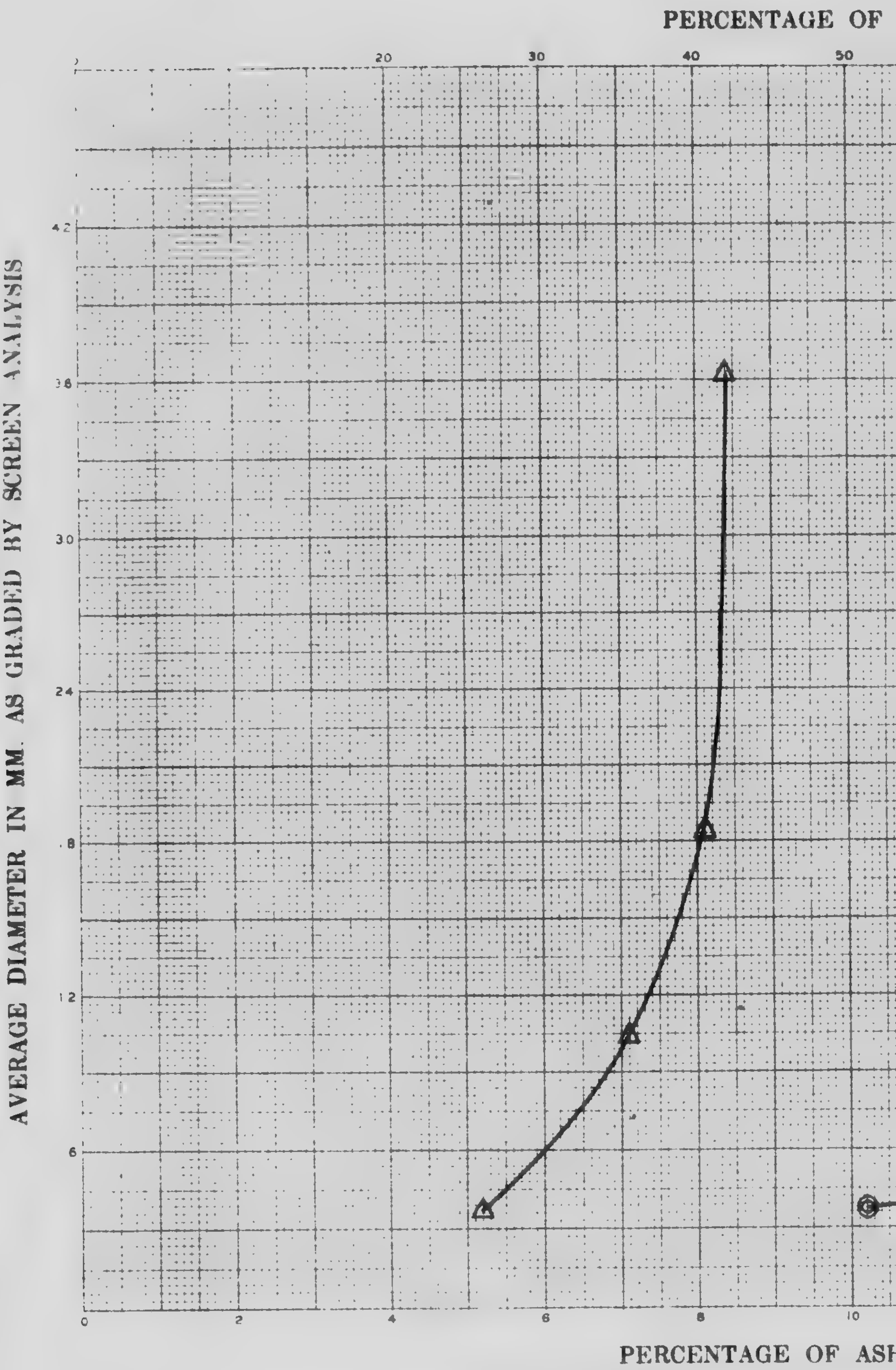
Summary Statement of Effect of Washing on Fuel Values.

31. Recovery of washed coal, including good bone . . % . . . . Ratio to standard . . .
32. Reduction in ash . . . . % " "
33. " " sulphur. . . . . % " "
34. Increase in calorific value—calorimeter . . . . %
35 Increase in evaporation under boiler. . . . . . %
36. Decrease in clinker under boiler. . . . . %
27. Fuel ratio of original coal. . . . .
38. " " washed " . . . .
39. Calorific value of original coal. . . . . . .
40. " " washed " . . . .

Remarks on Tables C D, and E.—It was not considered necessary to wash this sample.

AVERAGE DIAMETER IN MM AS GRADED BY SCREEN ANAL

GRAPHIC RECORD OF SIZING



LEGEND: SYMBOLS.

○ Curve showing the relative quantities of the several sizes.
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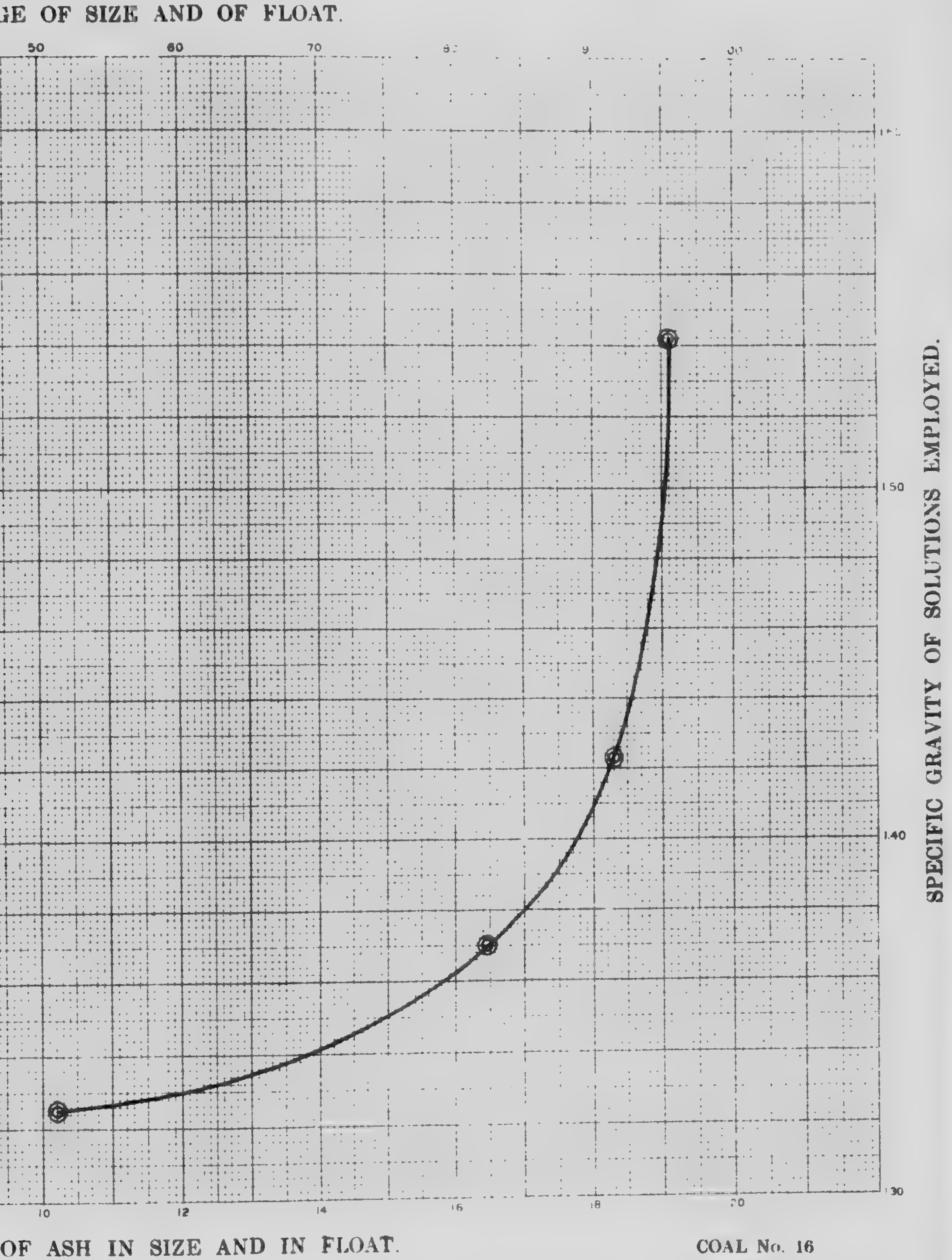
IZING AND SPECIFIC GRAVITY TESTS



COAL No. 16
APPENDIX I, VOL. III

ses.
he several densities.

COAL.—No. 1.

Locality.—Stellarton, Pictou county, N.S.

Colliery.—Acadia Coal Co., Albion colliery, 3rd seam.

Sample.—Ten tons taken from rooms in the 3rd seam, 1,400 feet northwesterly from the slope, at a depth of about 1,100 feet, vertically from the surface. The sample was taken directly from the mine cars, and is classed as run of mine. Sampled March 26, 1907.

TABLE A.

Specific Gravity Tests.

	Specific gravity of solution.	Float %	Ash in Float %	Sink %	Ash in Sink %
1.	1·560............	93·0	11·5	7·0	50·5
2.	1·460............	85·2	10·7	14·8	35·6
3.	1·380............	78·7	10·0	21·3	30·5
4.	1·325............	54·9	9·2	45·1	....

The following results are obtained from the above data, and the chemists results :—

5. Good coal, Sp. Gr. under 1·375......................% yield 77·5 % ash 10·0
6. Bone coal, Sp. Gr. 1·375 to 1·55.................... " " 13·5 " " 18·6
7. Useful coal—sum of (5) and (6)...................... " " 91·0 " " 11·4
8. Refuse, Sp. Gr. over 1·55.......................... " " 9·0 " " 48·0
9. Assay of original sample raw coal as sent to chemist.............. " " 14·7
10. " " " " " " ....% sulphur 1·4
11. " " " " " " ....Fuel Ratio 1·86
12. Assay of mixed good and bone coal (5) and (6) .... " " ....

Remarks.— This coal has a very high proportion of innate ash for the district, a high proportion of medium bone coal, and a small proportion of refuse. The ash in the coal, therefore, cannot be materially reduced by washing, although the sulphur can be appreciably lowered.

TABLE B.

Screen Analysis.

	Maximum Screen MM.	Minimum Screen MM.	Mean MM.	% of whole sample	% Ash in size
13.	6·34	3·16	4·75	....	....
14.	3·16	1·20	2·18	....	....
15.	1·20	0·64	0·92	....	....
16.	0·64	0·30	0·47	....	....
17.	0·30	0·173	0·24	....	....
18.	0·173	0·000	0·086	....	....

Remarks.—No screen analyses were made.

TABLE C.

Results of Washing (Details of Sizes).

	Original coal and its products.	Sizes between 1" and ½" Total wt. lbs.	Ash. %	Sizes between ½" and ⅛" Total wt. lbs.	Ash. %	Sizes under ⅛" Total wt. lbs.	Ash. %
19.	Original coal ...	2834	14·8	1488	12·5	630	13·4
20.	Washed coal ...	2522	11·5	1272	11·0	474	10·4
21.	Refuse—coarse.	...	..	.			....
22	Hutch product						
23	Jig slimes	....		.			
24.	Table slimes		.			.	

TABLE D.

Results of Washing (Totals).

25.	Original coal	wt. in lbs.	4952	% ash	14·7	% sulphur	1·4
26.	Washed coal..........................	" "	4268	" "	12·3	" "	1·0
27.	Refuse	" "	474	" "	33·1	" "	...
28.	Other products......................	" "	117	" "	9·7	" "	....
29.	Loss	" "	93	" "	....	" "	....
30.	Loss in % 1·9.						

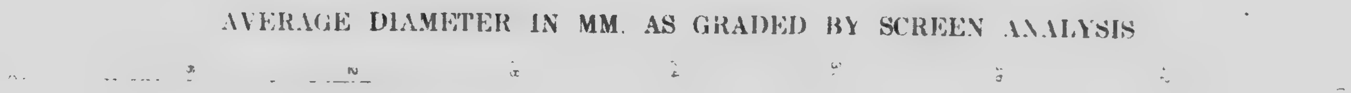
TABLE E.

Summary Statement of Effect of Washing on Fuel Values.

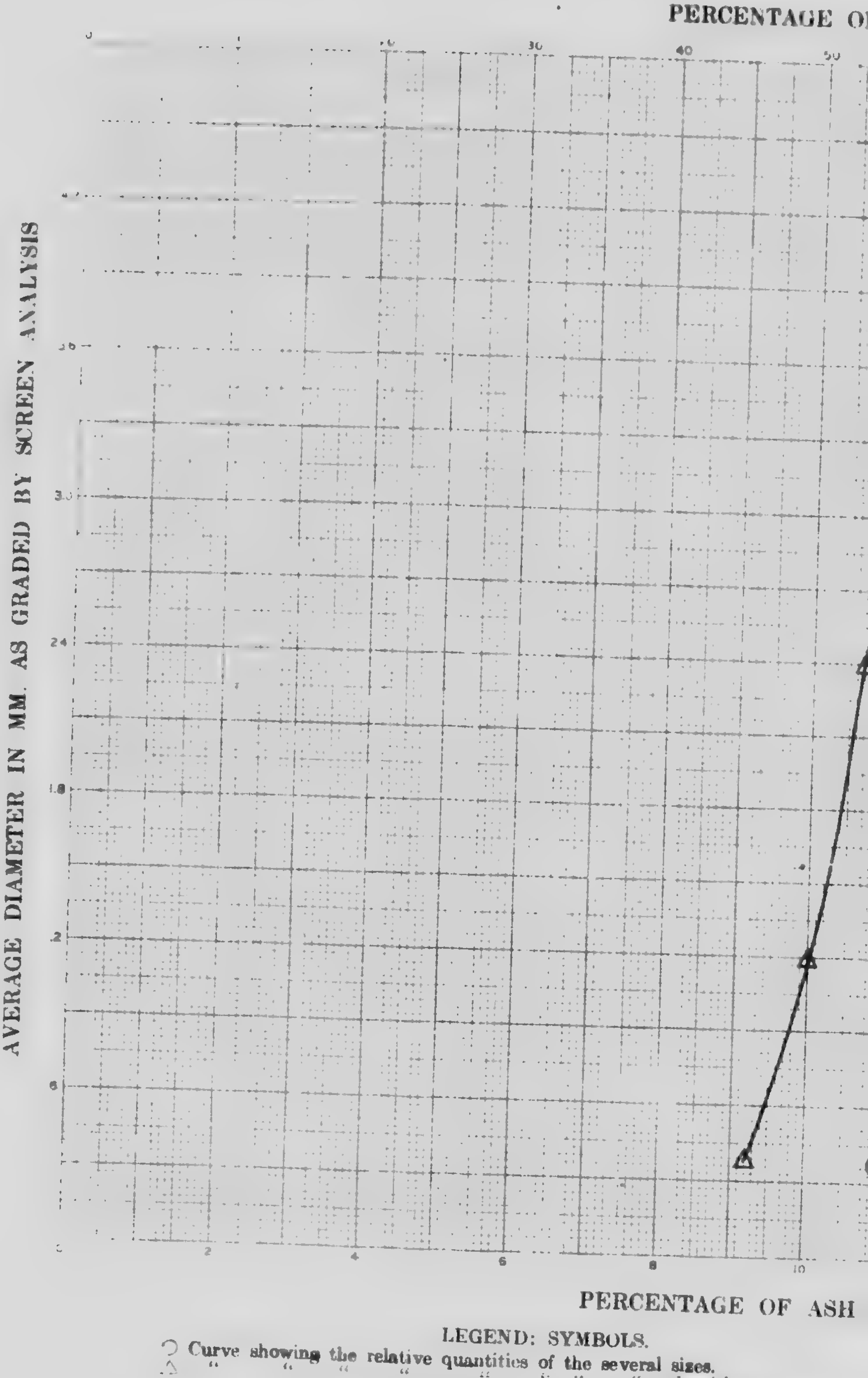
31.	Recovery of washed coal, including good bone. . %	86·0	Ratio to standard	94·5
32.	Reduction in ash.......................... %	16·3	" "	92·7
33.	" " sulphur........................ %	28·6	" "	100·0
34.	Increase in calorific value—calorimeter........ %	3·7		
35.	Increase in evaporation under boiler........... %	7·2		
36.	Decrease in clinker under boiler................ %	9·6		
37.	Fuel ratio of original coal......................	1·86		
38.	" " washed "	1·85		
39.	Calorific value of original coal..................	6990		
40	" " washed "	7250		

Remarks on Tables C, D, and E.—The procedure adopted in washing this coal differed from the standard in that the second size (from ½" to ⅛") was rejigged, as the first run did not give very satisfactory results. This rejigging, however, gave a refuse low in ash, thus indicating that the first jigging was more nearly perfect than had been supposed. In this connexion, the distribution of ash in the three sizes is worth noting, as it shows that the coarsest and finest sizes are more suitable for washing than the second size, thus confirming the above conclusions by experiments. All of the hutch product made was rejigged and the final hutch added to the refuse.

This coal contains much innate ash and a large proportion of bone, with a very small proportion of what might be termed straight refuse. It is thus an unsatisfactory coal to wash, as a considerable improvement can only be secured by the elimination of an excessive amount of material which has appreciable fuel value. On the whole, it is doubtful whether washing can be made commercially successful, although the results of a continual operation on a commercial scale would give a higher recovery of good coal and a lower percentage of fuel in the waste than the above test.


AVERAGE DIAMETER IN MM. AS GRADED BY SCREEN ANALYSIS

GRAPHIC RECORD OF SIZIN

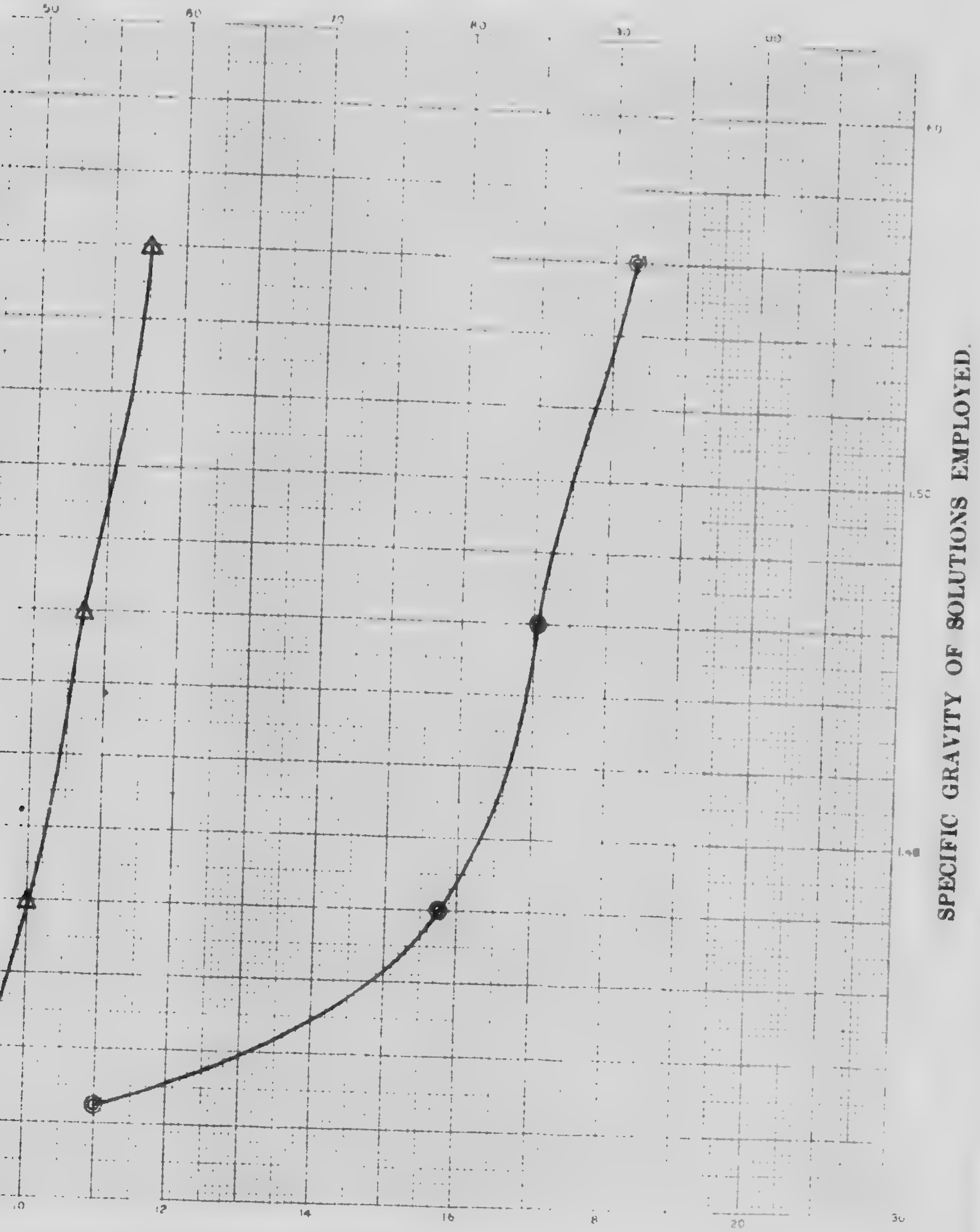


LEGEND: SYMBOLS.

○ Curve showing the relative quantities of the several sizes.
△ " " " " " " " densities.
□ " " " percentage of ash in each of the several sizes.
◎ " " " " " " " " material floating at the several de

SIZING AND SPECIFIC GRAVITY TESTS.

AGE OF SIZE AND OF FLOAT.



F ASH IN SIZE AND IN FLOAT.

COAL No. 1
Appendix I. Vol. III

several densities.

COAL.—No. 2.

Locality.—Stellarton, Pictou county, N.S.

Colliery.—Acadia Coal Co., Albion colliery, Cage Pit seam.

Sample.—Ninety-four bags of run of mine coal from level on north side of main slope at a depth of 2,600 feet, 700 feet vertical. Sampled March 26, 1907.

TABLE A.

Specific Gravity Tests.

	Specific gravity of solution.	Float %	Ash in Float %	Sink %	Ash in Sink %
1.	1·551	95·0	8·1	5·0	48·7
2.	1·426	88·8	7·4	11·2	32·2
3.	1·380	74·4	6·1	25·6	22·4
4.	1·325	34·3	3·7	65·7	13·9

The following results are obtained from the above data, and the chemists results:—

5.	Good coal, Sp. Gr. under 1·375	% yield	71·7	% ash	5·9
6.	Bone coal, Sp. Gr. 1·375 to 1·55	" "	23·3	" "	14·8
7.	Useful coal—sum of (5) and (6)	" "	95·0	" "	8·1
8.	Refuse, Sp. Gr. over 1·55	" "	5·0	" "	50·2
9.	Assay of original sample raw coal as sent to chemist			" "	10·5
10.	" " " " " "			% sulphur	0·9
11.	" " " " " "			Fuel Ratio	1·85
12.	Assay of mixed good and bone coal (5) and (6)			" "	....

Remarks.—This coal has high innate ash for the district and a large proportion of bone coal, carrying moderate ash. The refuse is small in amount and low in ash. The coal could not be commercially improved by washing.

TABLE B.

Screen Analysis

	Maximum Screen MM.	Minimum Screen MM.	Mean MM.	% of whole sample.	% Ash in size.
13.	....	....	....		
14.					...
15					...
16.					...
17.					
18.					....

TABLE C

Results of Washing (Details of Sizes).

	Original coal and its products.	Sizes between 1" and ½" Total wt. lbs.	Ash. %	Sizes between ½" and ¼" Total wt. lbs.	Ash. %	Sizes under ¼" Total wt. lbs.	Ash. %
19.	Original coal	This coal was not washed.					
20.	Washed coal						
21.	Refuse—coarse						
22.	Hutch product						
23.	Jig slimes						
24.	Table slimes						

TABLE D.

Results of Washing (Totals).

25. Original coal ..... wt. in lbs. ..... % ash ..... % sulphur ..
26. Washed coal ..... " " ..... " " ..... " " ..
27. Refuse ..... " " ..... " " ..... " " ..
28. Other products ..... " " ..... " " ..... " " ..
29. Loss ..... " " ..... " " ..... " " ..
30. Loss in %

TABLE E.

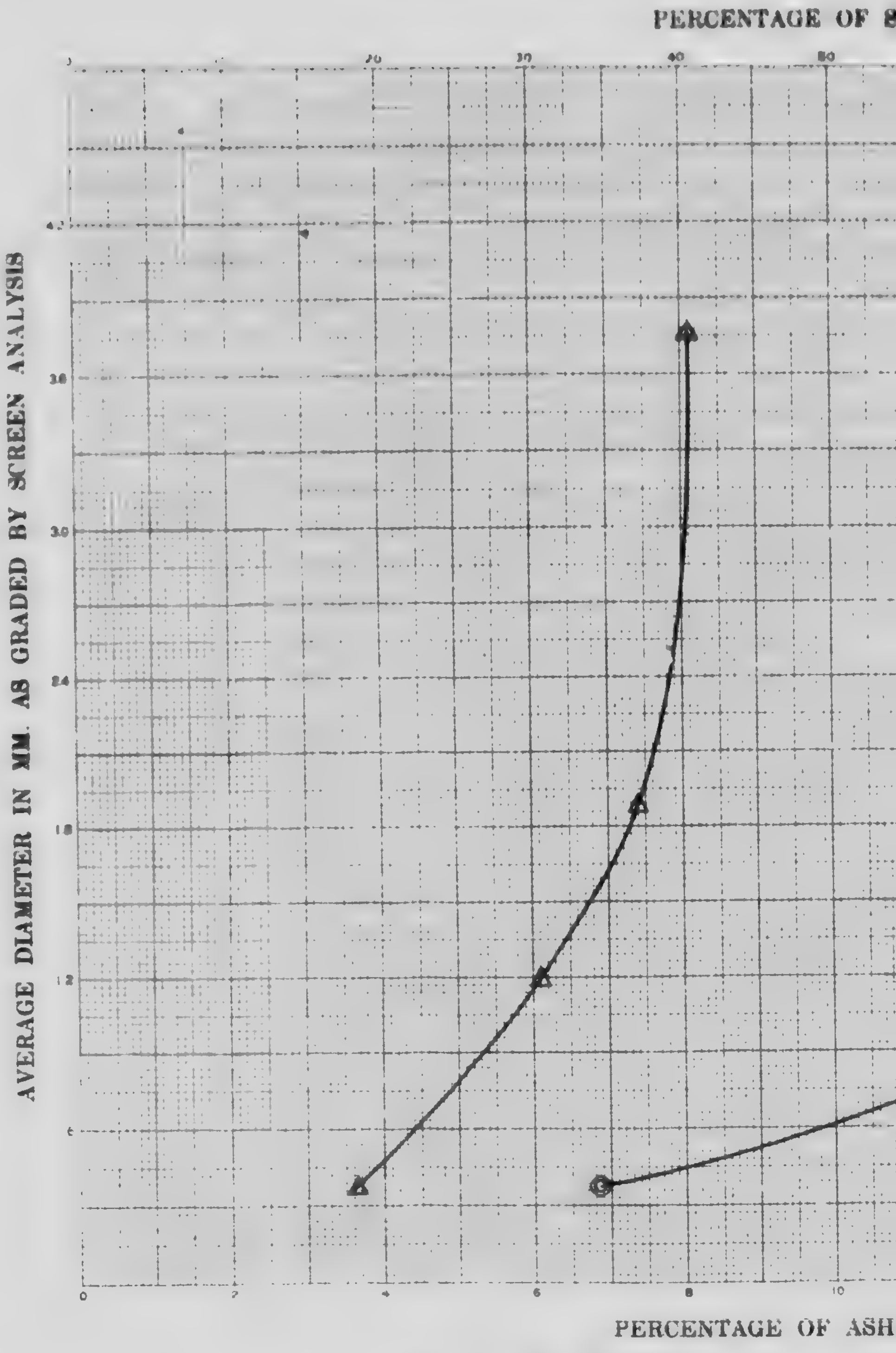
Summary Statement of Effect of Washing on Fuel Values.

31. Recovery of washed coal, including good bone. % .. Ratio to standard ....
32. Reduction in ash ..... % .. " " ....
33. " " sulphur ..... % .... " " ....
34. Increase in calorific value—calorimeter ..... %
35. Increase in evaporation under boiler ..... % ..
36. Decrease in clinker under boiler ..... % ....
37. Fuel ratio of original coal ....
38. " " washed " ....
39. Calorific value of original coal ..
40 " " washed " ..

Remarks on Tables C. D, and E.—It was not considered necessary to wash this sample.

AVERAGE DIAMETER IN MM AS GRADED BY SCREEN ANALYSIS

GRAPHIC RECORD OF SIZING



LEGEND: SYMBOLS.

○ Curve showing the relative quantities of the several sizes.
△ " " " " " " " " densities.
□ " " " percentage of ash in each of the several sizes.
⊙ " " " " " " " material floating at the several

ING AND SPECIFIC GRAVITY TESTS.

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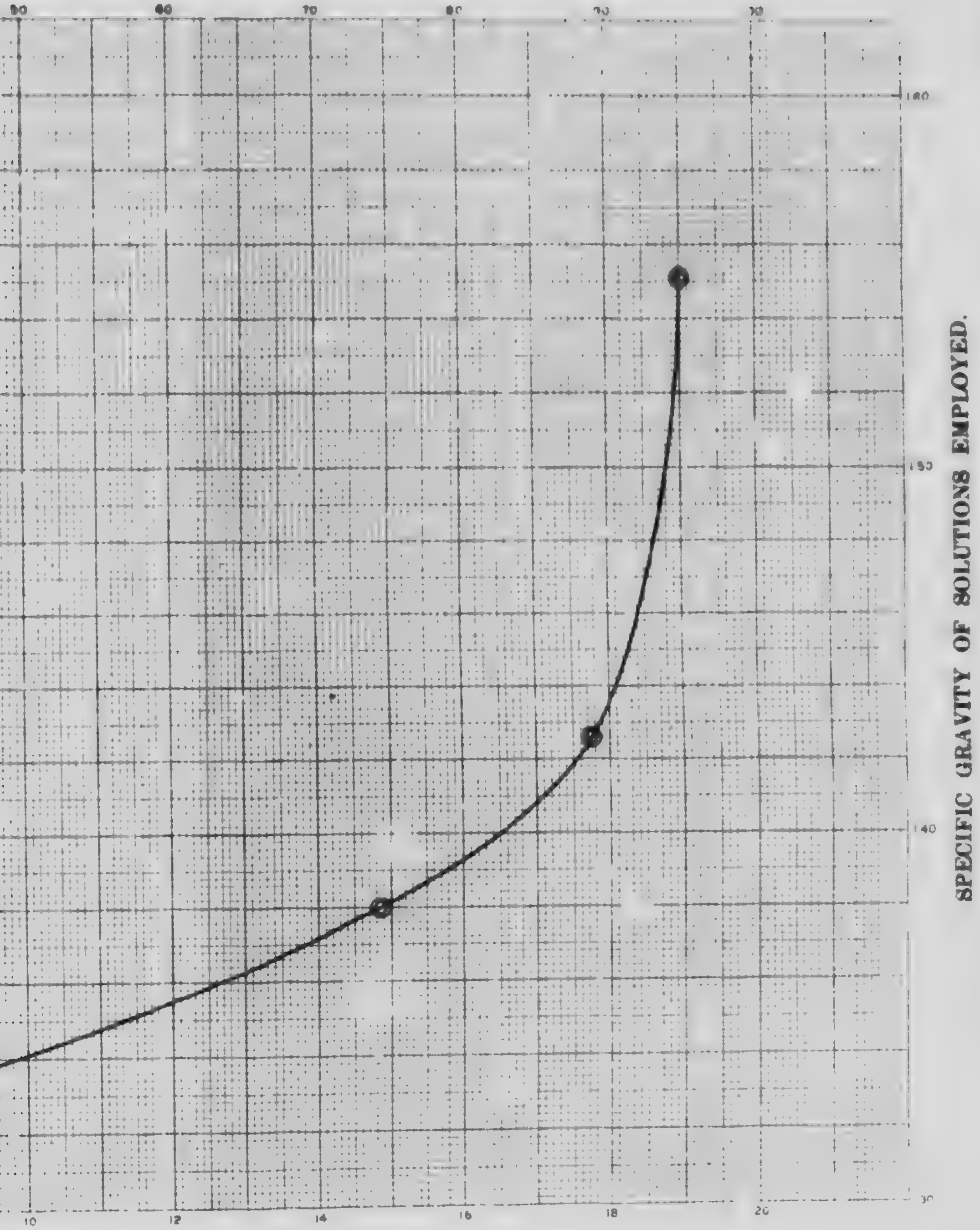


OF ASH IN SIZE AND IN FLOAT.

COAL No. 2
APPENDIX I, VOL. III

e several densities.

COAL.—No. 8.

Locality.—Westville, Pictou county, N.S.

Colliery.—Acadia Coal Co., Acadia colliery, Main seam.

Sample.—Seventy-five bags from II level 5,000 feet south. The sample was lump coal which had been cleaned on a 1″ screen and then hand picked. Sampled March 28, 1907.

TABLE A.

Specific Gravity Tests.

	Specific gravity of solution.	Float %	Ash in Float %	Sink %	Ash in Sink %
1.	1·553	94·4	6·7	5·6	48·5
2.	1·426	86·8	5·5	13·2	34·7
3.	1·380	80·3	4·1	19·7	26·2
4.	1·325	58·2	2·6	41·8	17·6

The following results are obtained from the above data, and the chemists results :

5.	Good coal, Sp. Gr. under 1·375	% yield	79·4	% ash	4·0
6.	Bone coal, Sp. Gr. 1·375 to 1·55	" "	14·9	" "	21·1
7.	Useful coal—sum of (5) and (6)	" "	94·3	" "	6·7
8.	Refuse, Sp. Gr. over 1·55	" "	5·7	" "	45·3
9.	Assay of original sample raw coal as sent to chemist			" "	9·2
10.	" " " " " "			% sulphur	0·9
11.	" " " " " "			Fuel Ratio	2·41
12.	Assay of mixed good and bone coal (5) and (6)			" "	

Remarks.—This coal carries a comparatively small proportion of innate ash and the bone coal is moderately low, both in quantity and ash. The refuse is low in ash and the coal would be very little improved by washing, which is out of the question from the commercial point of view.

TABLE B

Screen Analysis.

	Maximum Screen MM.	Minimum Screen MM.	Mean MM.	% of whole sample.	% Ash in size.
13					
14.					
15					
16					
17.					
18					

TABLE C

Results of Washing (Details of Sizes).

	Original coal and its products.	Sizes between 1" and ½" Total wt. lbs.	Ash. %	Sizes between ½" and ⅛" Total wt. lbs.	Ash. %	Sizes under ⅛" Total wt. lbs.	Ash. %
19.	Original coal						
20.	Washed coal						
21.	Refuse—coarse	This coal was not washed					
22.	Hutch product						
23.	Jig slimes						
24	Table slimes						

TABLE D

Results of Washing (Totals).

25.	Original coal	wt. in lbs.	% ash	% sulphur
26.	Washed coal	" "	" "	" "
27.	Refuse	" "	" "	" "
28.	Other products	" "	" "	" "
29.	Loss	" "	" "	" "
30.	Loss in %			

TABLE E.

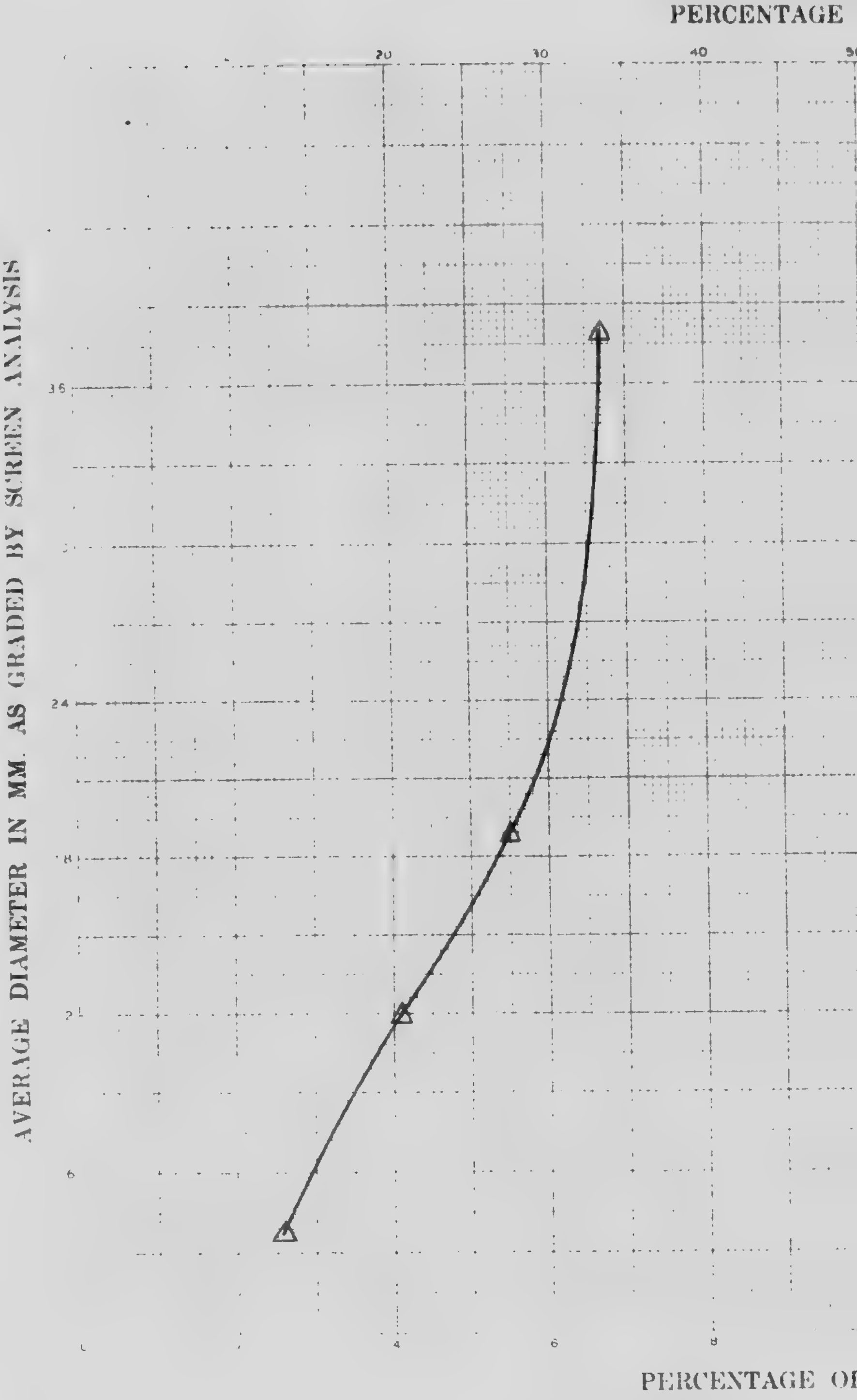
Summary Statement of Effect of Washing on Fuel Values.

31.	Recovery of washed coal, including good bone	%	Ratio to standard
32.	Reduction in ash	%	" "
33.	" " sulphur	%	" "
34.	Increase in calorific value—calorimeter	%	
35.	Increase in evaporation under boiler	%	
36.	Decrease in clinker under boiler	%	
37.	Fuel ratio of original coal		
38.	" " washed "		
39.	Calorific value of original coal		
40.	" " washed "		

Remarks on Tables C, D, and E.—It was not considered necessary to wash this sample.

AVERAGE DIAMETER IN MM. AS GRADED BY SCREEN ANALYSIS
24

GRAPHIC RECORD OF SIZIN

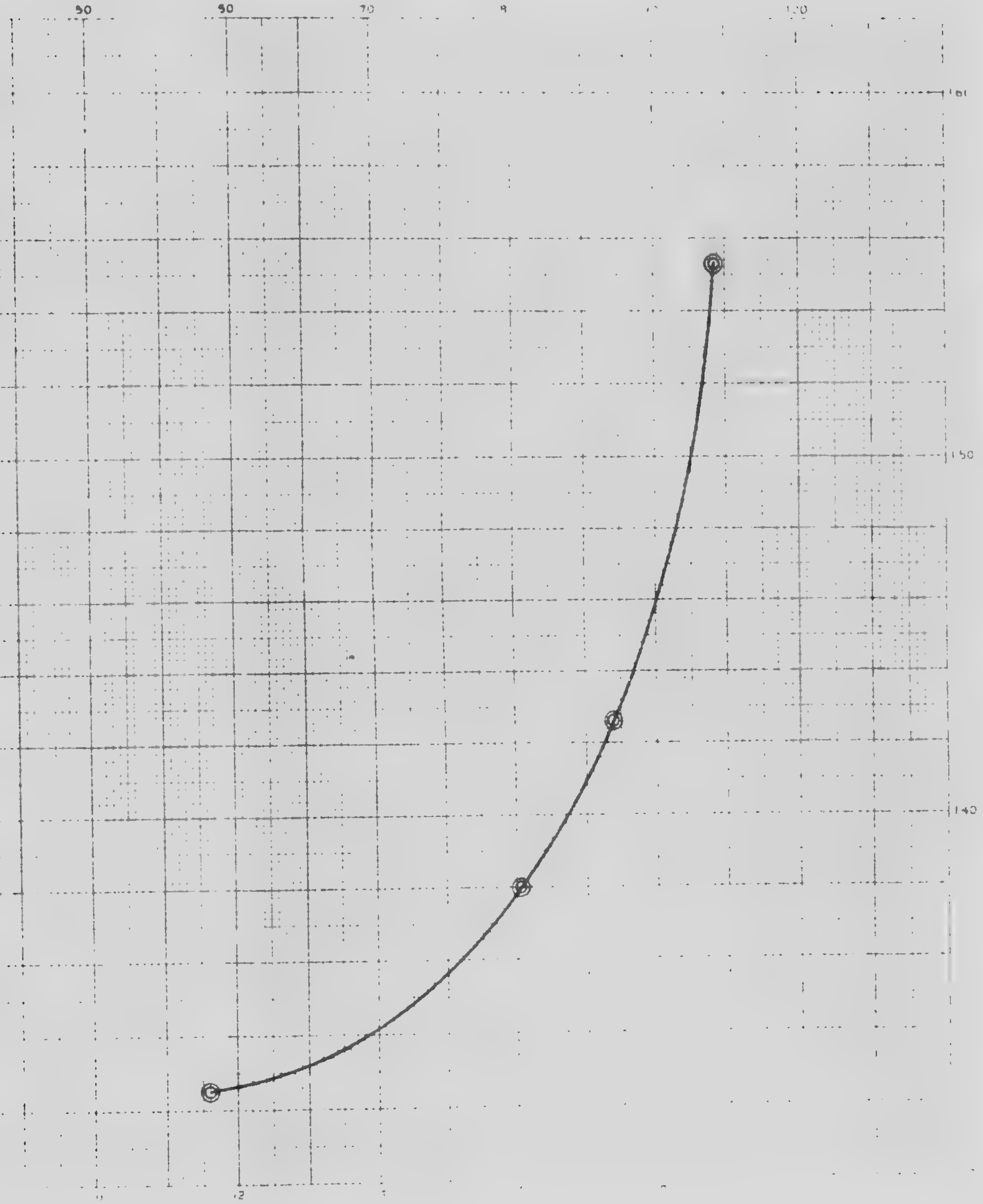


LEGEND: SYMBOLS.

Curve showing the relative quantities of the several sizes.
“ “ “ “ “ “ “ densities.
“ “ “ percentage of ash in each of the several size
“ “ “ “ “ “ “ material floating at the

SIZING AND SPECIFIC GRAVITY TESTS.

NTAGE OF SIZE AND OF FLOAT.



AGE OF ASH IN SIZE AND IN FLOAT

COAL No. 8
APPENDIX I. VOL. III

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ng at the several densities.

COAL.—No. 3.

Locality.—Westville, Pictou county, N.S.

Colliery.—Intercolonial Coal Company, Drummond colliery, Main seam.

Sample.—The sample, of approximately nine tons, was taken from the main seam, at the 6,400 ft. and 6,860 ft. levels, about 3,000 feet to the left of the slope, the inclination of the seam at that point being about 16°. The sample consisted of lump coal, prepared under the ordinary shipping conditions of the colliery; that is to say, screening over 1″ and then hand picking on a belt. Sampled March 27, 1907.

TABLE A.

Specific Gravity Tests.

	Specific gravity of solution.	Float %	Ash in Float %	Sink %	Ash in Sink %
1.	1·55	89·4	9·8	10·6	50·8
2.	1·45	81·0	8·4	19·0	40·2
3.	1·38	77·1	7·3	22·9	34·6
4.	1·32	58·3	6·2	41·6	25·8

The following results are obtained from the above data, and the chemists results :—

5.	Good coal, Sp. Gr. under 1·375	% yield	77·0	% ash	7·3
6.	Bone coal, Sp. Gr. 1·375 to 1·55	" "	12·0	" "	24·6
7.	Useful coal—sum of (5) and (6)	" "	89·0	" "	9·7
8.	Refuse, Sp. Gr. over 1·55	" "	11·0	" "	50·8
9.	Assay of original sample raw coal as sent to chemist			" "	14·5
10.	" " " " " "			% sulphur	2·5
11.	" " " " " "			Fuel Ratio	2·46
12.	Assay of mixed good and bone coal (5) and (6)			" "	....

Remarks.—This coal has a high proportion of innate ash, a moderate proportion of average bone coal, and a somewhat lower proportion than usual of light bone coal, low in ash. The refuse is moderate and rather high in ash. The ash, therefore, can not be greatly reduced by washing, but the sulphur, which is largely in the form of heavy material, is very considerably lowered.

TABLE B.

Screen Analysis.

	Maximum Screen MM.	Minimum Screen MM.	Mean MM.	% of whole sample	% Ash in size
13.	6·34	3·16	4·75	....	....
14.	3·16	1·20	2·18	....	...
15.	1·20	0·64	0·92	....	....
16.	0·64	0·30	0·47	....	..
17.	0·30	0·173	0·24	...	
18.	0·173	0·000	0·086	....	....

Remarks.—No screen analyses were made of this coal.

TABLE C.

Results of Washing (Details of Sizes).

	Original coal and its products.	Sizes between 1″ and ½″ Total wt. lbs.	Ash. %	Sizes between ½″ and ¼″ Total wt. lbs.	Ash. %	Sizes under ¼″ Total wt. lbs.	Ash. %
19.	Original coal ...	2809	16·5	1419	13·0	....	....
20.	Washed coal. ..	2467	11·8	1043	9·7	....	....
21.	Refuse—coarse..	....	....	....	....	....	....
22.	Hutch product.				...	....	....
23.	Jig slimes		.	.	....	. ..	....
24.	Table slimes ..		.	.	....	...	....

TABLE D.

Results of Washing (Totals).

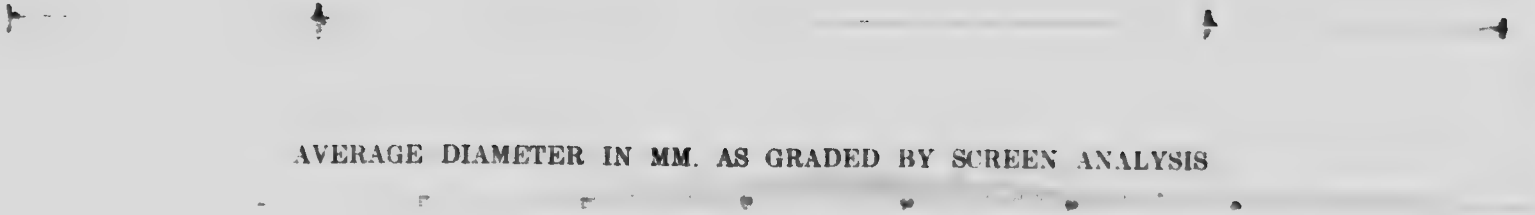
25.	Original coal	wt. in lbs.	4228	% ash	14·5	% sulphur	2·5
26.	Washed coal....	" "	3469	" "	11·3	" "	1·3
27.	Refuse..	" "	506	" "	36·0	" "	....
28.	Other products.....................	" "	126	" "	....	" "	....
29.	Loss.	" "	127	" "	....	" ..	....
30.	Loss in % 3·0.						

TABLE E.

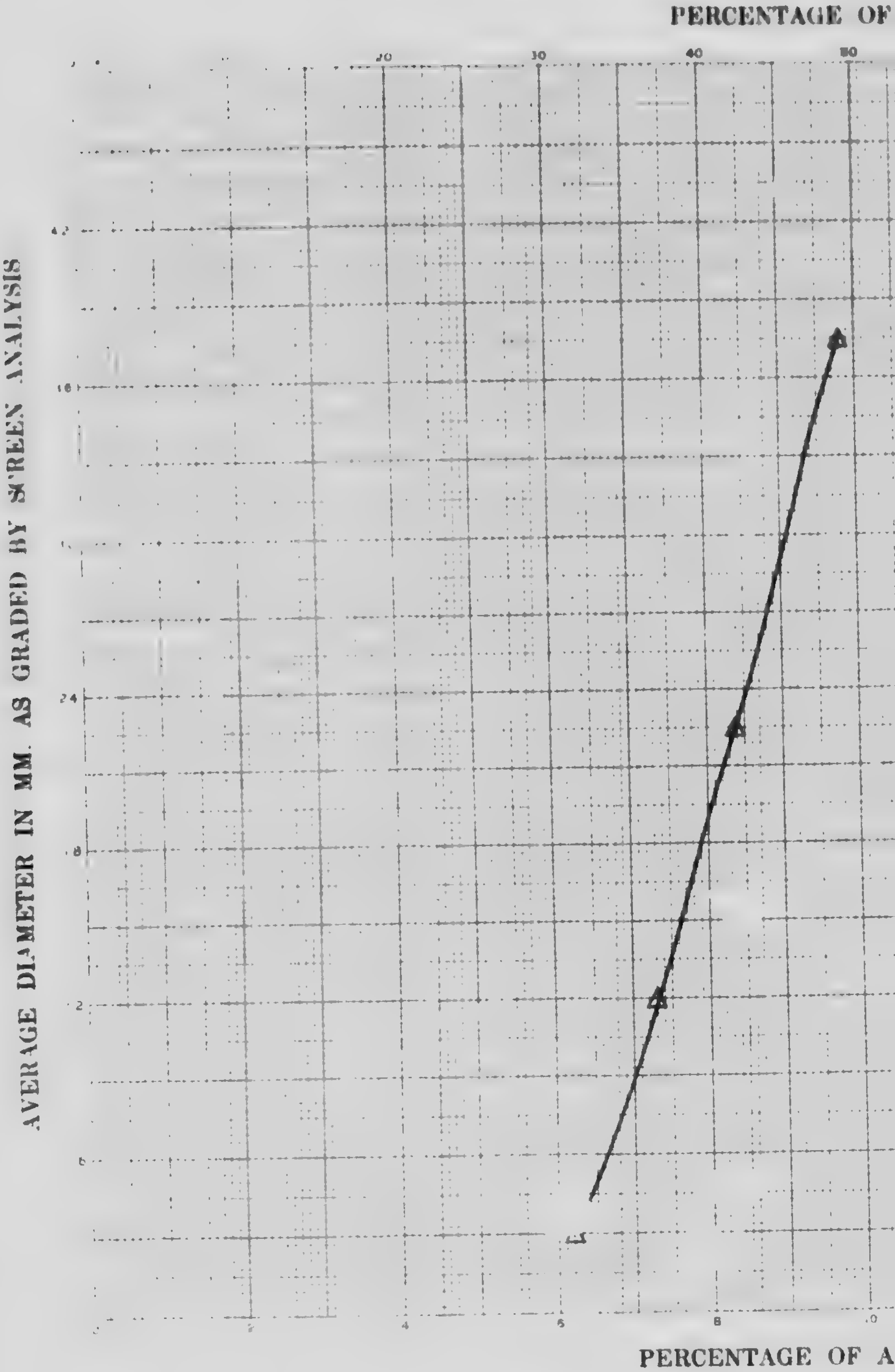
Summary Statement of Effect of Washing on Fuel Values.

31.	Recovery of washed coal, including good bone. .	%	82·0	Ratio to standard	92·1
32.	Reduction in ash............................	%	22·1	" "	85·8
33.	" " sulphur.	%	48·0	" "	85·7
34.	Increase in calorific value—calorimeter	%	4·6		
35.	Increase in evaporation under boiler...........	%	8·3		
36.	Decrease in clinker under boiler...	%	35·3		
37.	Fuel ratio of original coal.......		2·46		
38.	" " washed "		2·50		
39.	Calorific value of original coal........		7200		
40.	" " washed "		7530		

Remarks on Tables C, D, and E.—The results of the washing trial check very well with the specific gravity tests, although the recovery of washed coal is smaller in quantity and the refuse contains more good coal than would be the case in large commercial operations. Owing to the large proportion of bone, it is impossible to make a very clean coal without great loss. A moderate degree of washing, however, greatly improves the material in respect of sulphur. It is probable, therefore, that washing, while justifiable as a preparation for cooking, will never be warranted for fuel purposes alone.


AVERAGE DIAMETER IN MM. AS GRADED BY SCREEN ANALYSIS

GRAPHIC RECORD OF SIZING

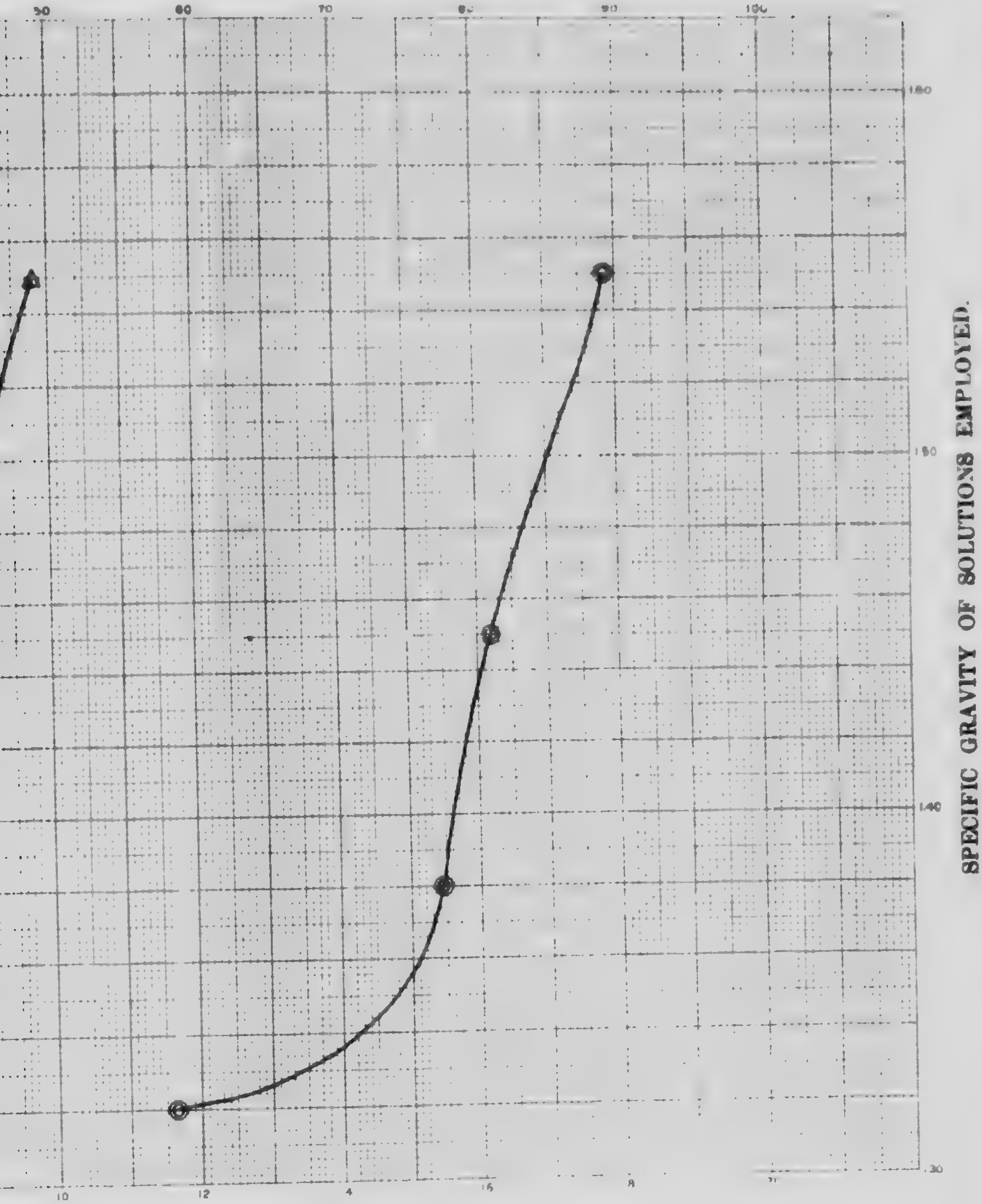


LEGEND: SYMBOLS.

Curve showing the relative quantities of the several sizes.
" " " " " " " " densities.
△ " " " percentage of ash in each of the several sizes.
● " " " " " " material floating at the seve

IZING AND SPECIFIC GRAVITY TESTS

GE OF SIZE AND OF FLOAT



E OF ASH IN SIZE AND IN FLOAT.

COAL No. 3
APPENDIX I, VOL. III

es.
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t the several densities.

SPRINGHILL COAL FIELD.

CUMBERLAND CO., NOVA SCOTIA.

ERRATUM

On the curve diagrams accompanying the tabulated records of each of the coals tested is the following legend:—

LEGEND: SYMBOLS

Curve showing the relative quantities of the several sizes
2 " " " " " " densities
3 " " percentage of ash in each of the several sizes
4 " " " " " " material floating at the several densities

The above legend is incorrect; in each case it should read thus:—

Curve showing the relative quantities of the several sizes
" " " percentage of ash in each of the several sizes
3 " " " " " material floating at the several densities
4 " " " " " ash in " " " [illegible]

COAL.—No. 5.

Locality.—Springhill, Cumberland county, N.S.

Colliery.—Cumberland Railway and Coal Co., No. 2 colliery.

Sample.—Eleven tons taken from one hundred feet on each side of the slope at the 3,800 ft. level. The sample consists of lump coal which had been cleaned by passing over a ¾″ screen, and by hand picking. Sampled April 1, 1907.

TABLE A.

Specific Gravity Tests.

	Specific gravity of solution.	Float %	Ash in Float %	Sink %	Ash in Sink %
1.	1·52	91·0	5·7	9·0	41·8
2.	1·44	86·7	5·2	13·3	33·8
3.	1·375	81·0	5·1	19·0	29·0
4.	1·310	55·0	3·4	45·0	16·0

The following results are obtained from the above data, and from the chemists results:—

5.	Good coal, Sp. Gr. under 1·375	% yield	81·0	% ash	5·1
6.	Bone coal, Sp. Gr. 1·375 to 1·55	" "	10·5	" "	14·7
7.	Useful coal—sum of (5) and (6)	" "	91·5	" "	6·1
8.	Refuse, Sp. Gr. over 1·55	" "	8·5	" "	47·3
9.	Assay of original sample raw coal as sent to chemist			" "	9·2
10.	" " " " " "			% sulphur	1·6
11.	" " " " " "			Fuel Ratio	1·81
12.	Assay of mixed good and bone coal (5) and (6)			"	

Remarks.—This coal has a moderate proportion of innate ash and but small proportions of refuse and bone coal, both of them comparatively low in ash. It is not well suited for washing, either for the reduction of ash or sulphur.

TABLE B

Screen Analysis.

	Maximum Screen MM.	Minimum Screen MM.	Mean MM.	% of whole sample	% Ash in size
13.	6·34	3·16	4·75		
14.	3·16	1·20	2·18		
15.	1·20	0·64	0·92		
16.	0·64	0·30	0·47		
17.	0·30	0·173	0·24		
18.	0·173	0·000	0·086		

Remarks.—No screen analyses were made.

TABLE C.

Results of Washing (Details of Sizes.)

	Original coal and its products.	Sizes between 1" and ½" Total wt. lbs.	Ash %	Sizes between ½" and ¼" Total wt. lbs.	Ash %	Sizes under ¼" Total wt. lbs.	Ash. %
19.	Original coal	3100	9·8	1575	8·6	472	8·4
20.	Washed coal	2749	7·4	1473	6·2	216	5·6
21.	Refuse—coarse						
	Hutch product						
23.	Jig slimes						
24.	Table slimes						

TABLE D.

Results of Washing (Totals).

		wt. in lbs.	% ash	% sulphur
25.	Original coal	5419	9·2	1·6
26.	Washed coal	4432	7·1	1·4
27.	Refuse	563	31·5	...
28.	Other products	59	..	...
29.	Loss	95	..	.
30.	Loss in %, 1·8			

TABLE E.

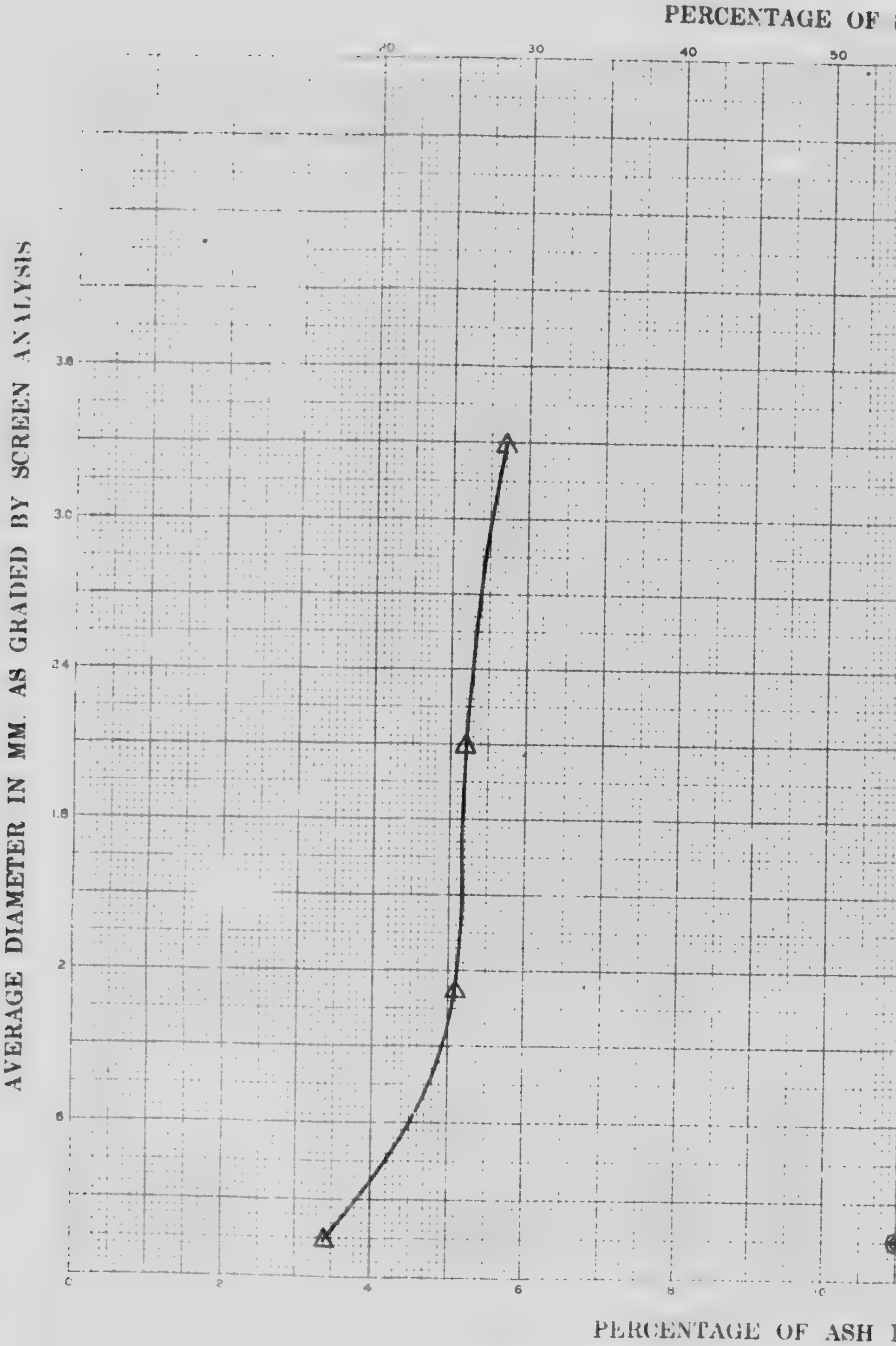
Summary Statement of Effect of Washing on Fuel Values.

31.	Recovery of washed coal, including good bone	%	81·6	Ratio to standard	89·2
32.	Reduction in ash	%	22·8	" "	85·9
33.	" " sulphur	%	12·5	" "	66·6
34.	Increase in calorific value—calorimeter	%	3·7		
35.	Increase in evaporation under boiler	%	12·7		
36.	Decrease in clinker under boiler	%	37·8		
37.	Fuel ratio of original coal		1·81		
38.	" " washed "		1·81		
39.	Calorific value of original coal		7430		
40.	" " washed "		7700		

Remarks on Tables C, D. and E.—The procedure in washing was normal and the results of the washing compare very well with those of the specific gravity determinations, although the recovery is lower and the refuse contains more fuel than would be the case in a commercial operation. The improvement due to washing is considerable, both as regards ash and sulphur, but it is improbable that washing would be commercially justifiable, as the coal is sufficiently good in the raw state.

AVERAGE DIAMETER IN MM. AS GRADED BY SCREEN ANALYSIS
2
8

GRAPHIC RECORD OF SIZING

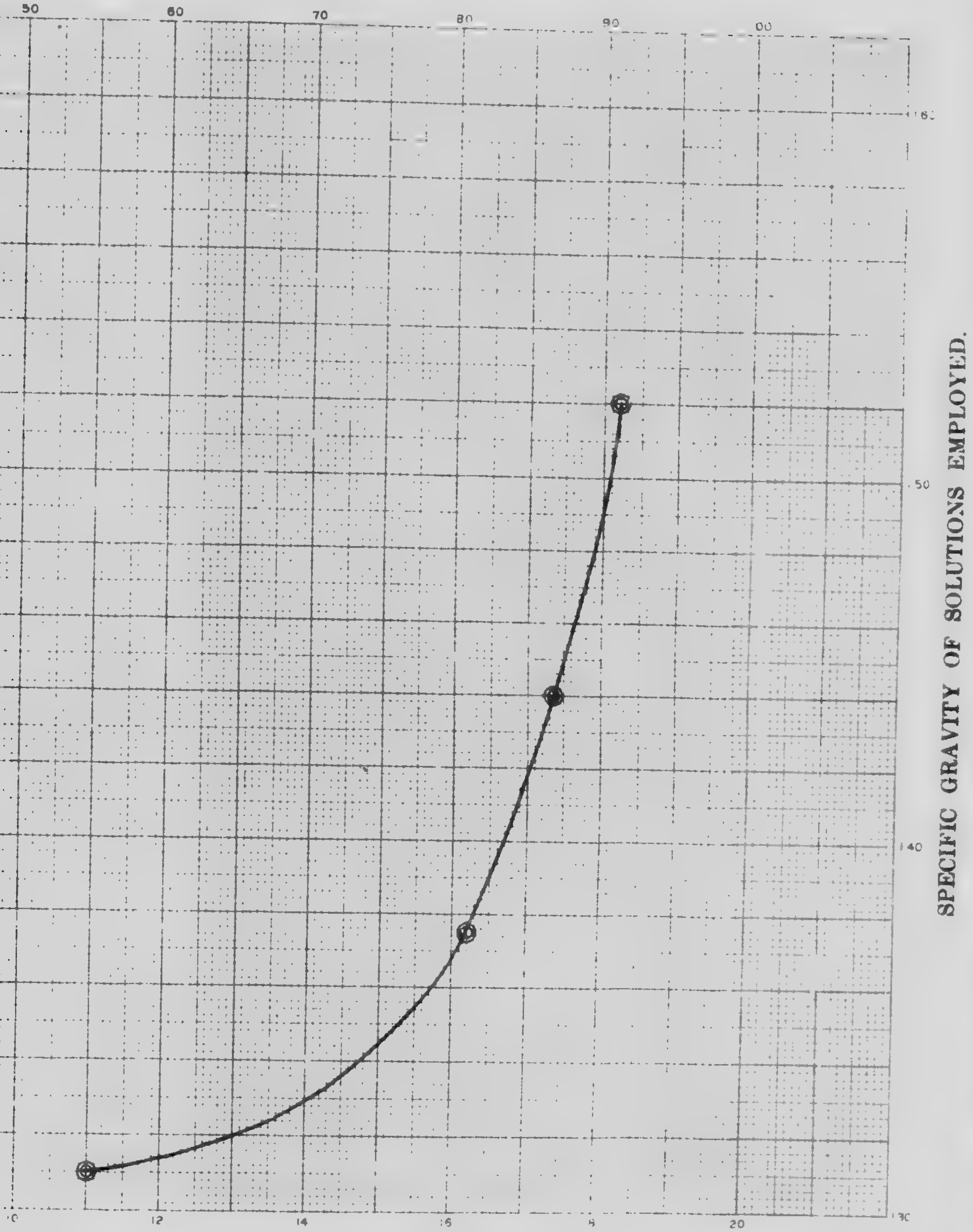


LEGEND: SYMBOLS.

○ Curve showing the relative quantities of the several sizes.
△ " " " " " " " " densities.
☐ " " " percentage of ash in each of the several sizes.
● " " " " " " " material floating at the several de

ZING AND SPECIFIC GRAVITY TESTS.

GE OF SIZE AND OF FLOAT.



ASH IN SIZE AND IN FLOAT.

COAL No. 5
Appendix I, Vol. III

several densities.

COAL.—No. 6.

Locality.—Springhill, Cumberland county, N.S.

Colliery.—Cumberland Railway and Coal Co., No. 3.

Sample.—Ten and a half tons were taken from three different levels, about three and a half tons coming from each of the following named localities : (*a*) 2,600 ft. level, about 3,500 feet west ; (*b*) 3,200 ft. level, about 3,500 feet west ; (*c*) 3,800 ft. level, both east and west. The sample was of lump coal, which had been cleaned by passing over a ¾″ screen, and then by hand picking. Sampled April 1, 1907.

TABLE A.

Specific Gravity Tests.

	Specific gravity of solution.	Float %	Ash in Float %	Sink %	Ash in Sink %
1.	1·540	89·7	7·0	10·3	48·2
2.	1·445	83·9	6·0	16·1	41·4
3.	1·390	81·5	5·7	18·5	35·6
4.	1·325	59·0	4·3	41·0	20·0

The following results are obtained from the above data, and the chemists results:—

5.	Good coal, Sp. Gr. under 1·375	% yield	80·0	% ash	5·4
6.	Bone coal, Sp. Gr. 1·375 to 1·55	" "	10·0	" "	19·0
7.	Useful coal—sum of (5) and (6)	" "	90·0	" "	7·1
8.	Refuse, Sp. Gr. over 1·55	" "	10·0	" "	48·5
9.	Assay of original sample raw coal as sent to chemist			" "	11·5
10.	" " " " " "			% sulphur	1·8
11.	" " " " " "			Fuel Ratio	1·64
12.	Assay of mixed good and bone coal (5) and (6)			" "	....

Remarks.—This coal has a higher proportion of innate ash than the other sample from the same locality. It also contains a larger proportion of refuse. It is, therefore, more suitable for washing, although the sulphur would not be largely reduced.

TABLE B.

Screen Analysis.

	Maximum Screen MM.	Minimum Screen MM.	Mean MM.	% of whole sample	% Ash in size.
13.	6·34	3·16	4·75	....	....
14.	3·16	1·20	2·18	....	....
15.	1·20	0·64	0·92	....	....
16.	0·64	0·30	0·47	....	....
17.	0·30	0·173	0·24	....	....
18.	0·173	0·000	0·086	....	

Remarks.—No screen analyses were made.

TABLE C.

Results of Washing (Details of Sizes).

	Original coal and its products.	Sizes 1" and ½" Total wt lbs.	Ash %	Sizes ½" and ¼" Total wt. lbs.	Ash %	Sizes under ¼" Total wt lbs.	Ash. %
19.	Original coal	3481	11·5	1675	10·0	502	10·5
20.	Washed coal	3165	8·15	1209	6·8	561	8·2
21.	Refuse—coarse						
22	Hutch product						
23	Jig slimes						
24.	Table slimes						

TABLE D.

Results of Washing (Totals).

25.	Original coal	wt. in lbs. 5658	% ash 11·5	% sulphur	1·8
26.	Washed coal.	" " 4935	" " 8·3	" "	1·5
27.	Refuse	" " 410	" " 45·0	" "	
28.	Other products	" " 105	" " 9·4	" "	
29.	Loss	" " 108	" "	" "	
30.	Loss in % 1·9				

TABLE E.

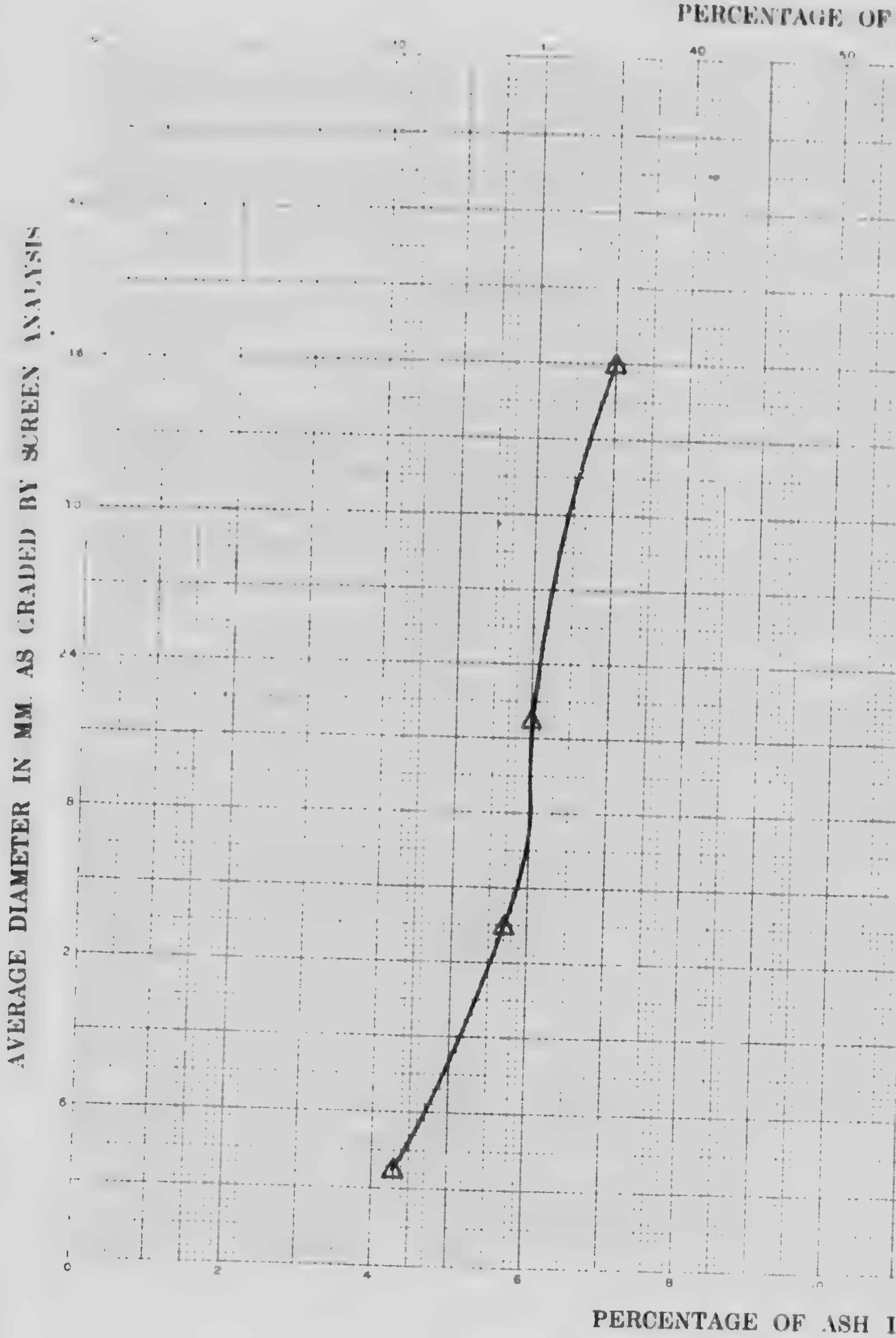
Summary Statement of Effect of Washing on Fuel Values.

31.	Recovery of washed coal, including good bone . . %	87·0	Ratio to standard	96·7
32.	Reduction in ash . . . . %	27·8	" "	85·5
33.	" " sulphur . . . . %	16·7	" "	100·0
34.	Increase in calorific value—calorimeter . . . . %	4·4		
35.	Increase in evaporation under boiler . . . . %	22·1		
36.	Decrease in clinker under boiler . . . . %	36·4		
37.	Fuel ratio of original coal	1·64		
38.	" " washed "	1·67		
39.	Calorific value of original coal	7220		
40.	" " washed "	7540		

Remarks on Tables C, D, and E.—The procedure in washing was normal, and the results compare very well with the specific gravity determinations, although the recovery is lower, and the refuse contains more good coal than would be the case in a commercial operation. The improvement in the steaming quality of the coal, due to washing, is very considerable, being, in fact, more marked than in the case of any other coal from the district. It is questionable, however, whether even this improvement would justify washing for fuel purposes alone. It would, however, probably be commercially justifiable to screen and wash the coal if it were to be used for coke.

AVERAGE DIAMETER IN MM. AS GRADED BY SCREEN ANALYSIS

GRAPHIC RECORD OF IZING

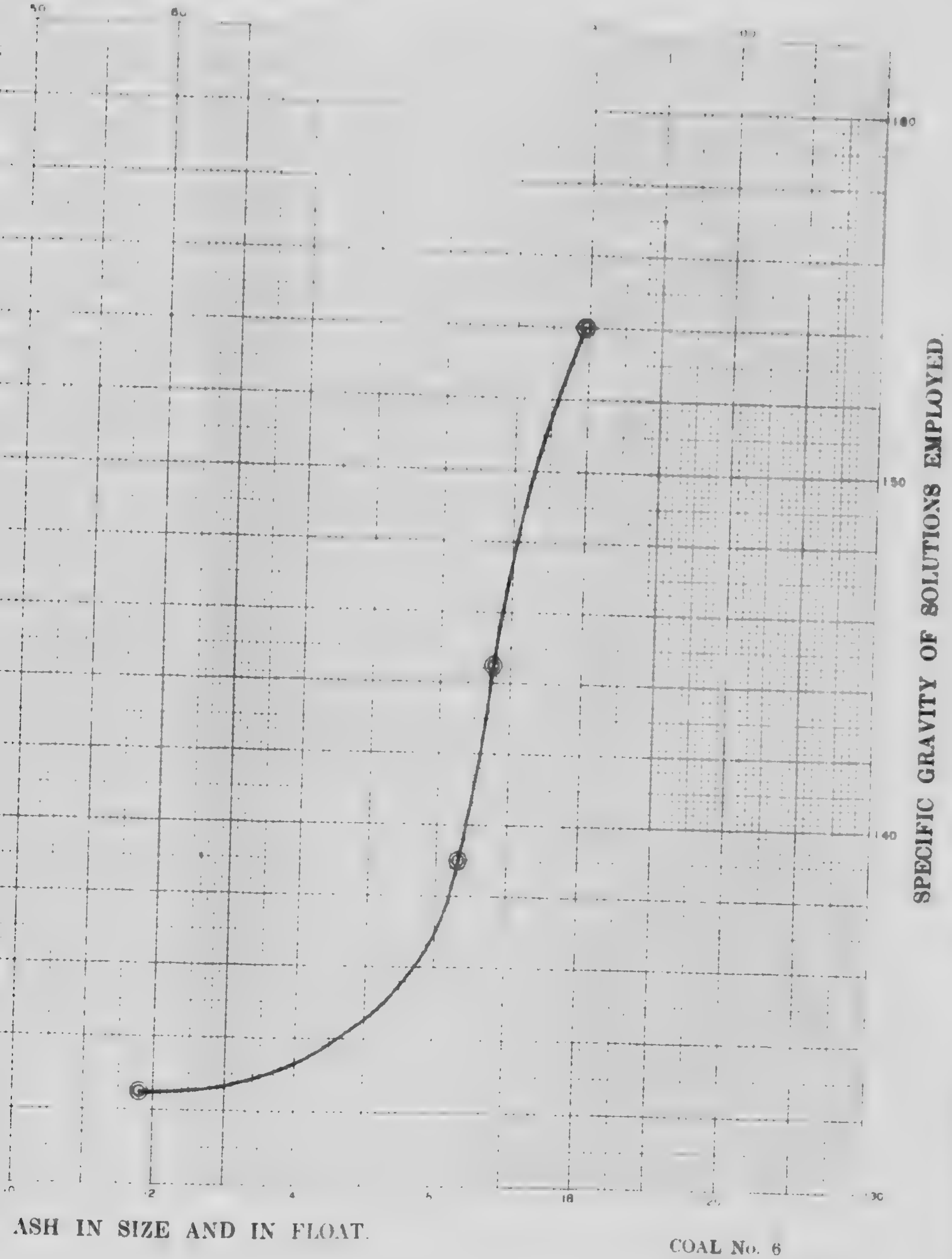


LEGEND: SYMBOLS.

○ Curve showing the relative quantities of the several sizes.
△ " " " " " " " " densities.
□ " " " percentage of ash in each of the several sizes.
● " " " " " " " material floating at the several den

IZING AND SPECIFIC GRAVITY TESTS

GE OF SIZE AND OF FLOAT



COAL No. 6
APPENDIX I, VOL. III

everal densities.

JOGGINS-CHIGNECTO COAL FIELD.

CUMBERLAND CO., NOVA SCOTIA.

ERRATUM

On the curve diagrams accompanying the tabulated records of each of the coals tested, is the following legend:—

LEGEND: SYMBOLS

Curve showing the relative quantities of the several sizes
" " " " " " " densities
○ " percentage of ash in each of the several sizes.
" " " " material floating at the several densities

The above legend is incorrect; in each case it should read thus:—

Curve showing the relative quantities of the several sizes
" " " percentage of ash in each of the several sizes
○ " " " " " material floating at the several densities
" " " " " ash in " " " " "

COAL.—No. 7.

Locality.—Chignecto, Cumberland county, N.S.

Colliery.—Maritime Coal, Railway, and Power Co., Chignecto colliery.

Sample.—The sample of about six tons is said to have come from the 1,300 ft. level, but, as has been stated elsewhere, the representative of the Department was not present at the time the sample was taken. Sampled April 1, 1907.

TABLE A.

Specific Gravity Tests.

	Specific gravity of solution.	Float %	Ash in Float %	Sink %	Ash in Sink %
1.	1·520	84·7	7·1	15·3	40·0
2.	1·425	70·2	5·9	29·8	27·8
3.	1·385	64·5	5·6	35·5	23·3
4.	1·315	31·5	4·0	68·5	15·0

The following results are obtained from the above data, and the chemists results :—

5.	Good coal, Sp. Gr. under 1·375	% yield	61·5	% ash	5·4
6.	Bone coal, Sp. Gr. 1·375 to 1·55	" "	27·5	" "	12·9
7.	Useful coal—sum of (5) and (6)	" "	89·0	" "	7·5
8.	Refuse, Sp. Gr. over 1·55	" "	11·0	" "	40·0
9.	Assay of original sample raw coal as sent to chemist			" "	13·3
10.	" " " " " "			% sulphur	6·4
11.	" " " " " "			Fuel Ratio	1·11
12.	Assay of mixed good and bone coal (5) and (6)			" "	...

Remarks.—This coal contains a moderately high proportion of innate ash, a large proportion of bone coal rather low in ash, and a considerable proportion of refuse containing so little ash as to approximate a very poor grade of bone coal. The coal is also unusually high in sulphur, which is chiefly innate. The ash may be considerably reduced by washing, but the sulphur cannot be materially lowered.

TABLE B.

Screen Analysis.

	Maximum Screen MM.	Minimum Screen MM.	Mean MM.	% of whole sample	% Ash in size
13.	6·34	3·16	4·75	....	.
14.	3·16	1·20	2·18	....	
15.	1·20	0·64	0·92	. .	.
16.	0·64	0·30	0·47	. .	.
17.	0·30	0·173	0·24	.	
18.	0·173	0·000	0·086		

Remarks.—No screen analyses were made.

TABLE C.

Results of Washing (Details of Sizes).

	Original coal and its products.	Sizes between 1″ and ½″ Total wt. lbs.	Ash. %	Sizes between ½″ and ⅛″ Total wt. lbs	Ash. %	Sizes under ⅛″ Total wt. lbs.	Ash. %
19.	Original coal	1625		1117			
20.	Washed coal	1520	9·0		10·5	293	12·7
21.	Refuse—coarse.	1304		1186*	8·7	....	....
22	Hutch produc				.	..	....
23	Jig slimes				.	.	....
24	Table slimes				. .	.	....

TABLE D.

Results of Washing (Totals).

25.	Original coal	wt. in lbs.	5734	% ash	13·3	% sulphur	6·4
26.	Washed coal	" "	4956	" "	9·1	" "	6·2
27.	Refuse	" "	555	" "	31·0	" "	....
28.	Other products	" "	77	" "	11·0	" "	....
29.	Loss	" "	146	" "	....	" "	....
30.	Loss in % 2·5						

TABLE E.

Summary Statement of Effect of Washing on Fuel Values.

31.	Recovery of washed coal, including good bone.	%	87·0	Ratio to standard	97·8
32.	Reduction in ash	%	31·5	" "	82·5
33.	" " sulphur	%	3·1	" "	20·0
34.	Increase in calorific value—calorimeter	%	6·1		
35.	Increase in evaporation under boiler	%	11·2		
36.	Decrease in clinker under boiler	%	34·3		
37.	Fuel ratio of original coal		1·11		
38.	" " washed "		1·20		
39.	Calorific value of original coal		6750		
40.	" " washed "		7160		

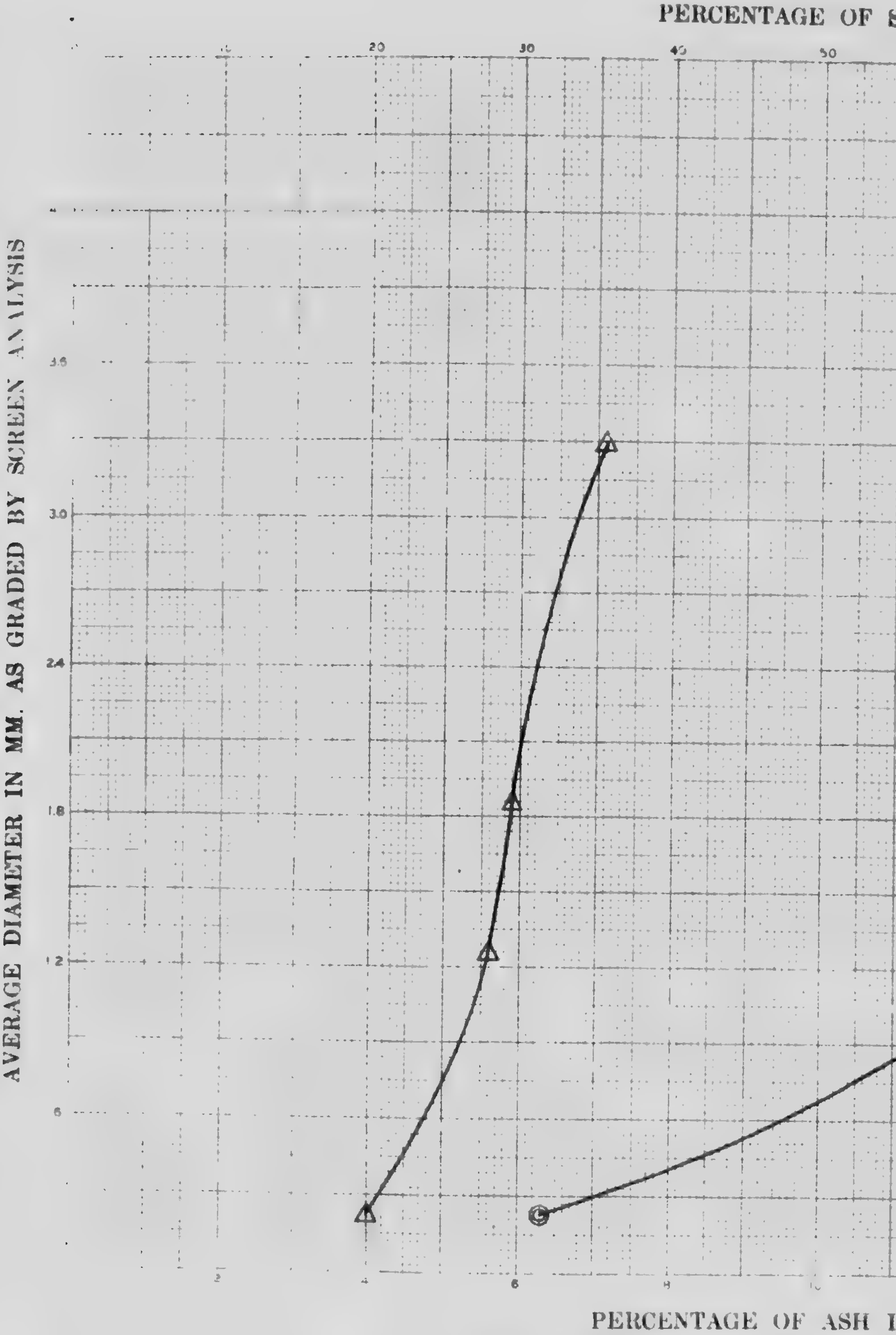
Remarks on Tables C, D, and E.—The procedure adopted in washing this coal differed from the standard, as it was deemed desirable to compare two different methods. A portion of the coal was all crushed to pass ½″, and was then sized into three lots—½″ to ¼″, ¼″ to ⅛″, and ⅛″ to 0, and each size washed separately. The second portion of the sample was washed in the ordinary manner. The results reported above were obtained by combining the products of both experiments.

The result of the washing trials compares fairly well with those from the specific gravity tests, but in the case of this particular coal it is evident that maximum density adopted as a standard (namely 1·55) is too low, as the material sinking at that point contains less ash than with other eastern coals.

The possible reduction of ash and sulphur, even under ideal circumstances, is, however, small, and it is improbable that washing will be commercially justifiable.

AVERAGE DIAMETER IN MM. AS GRADED BY SCREEN ANALYSIS

GRAPHIC RECORD OF SIZING

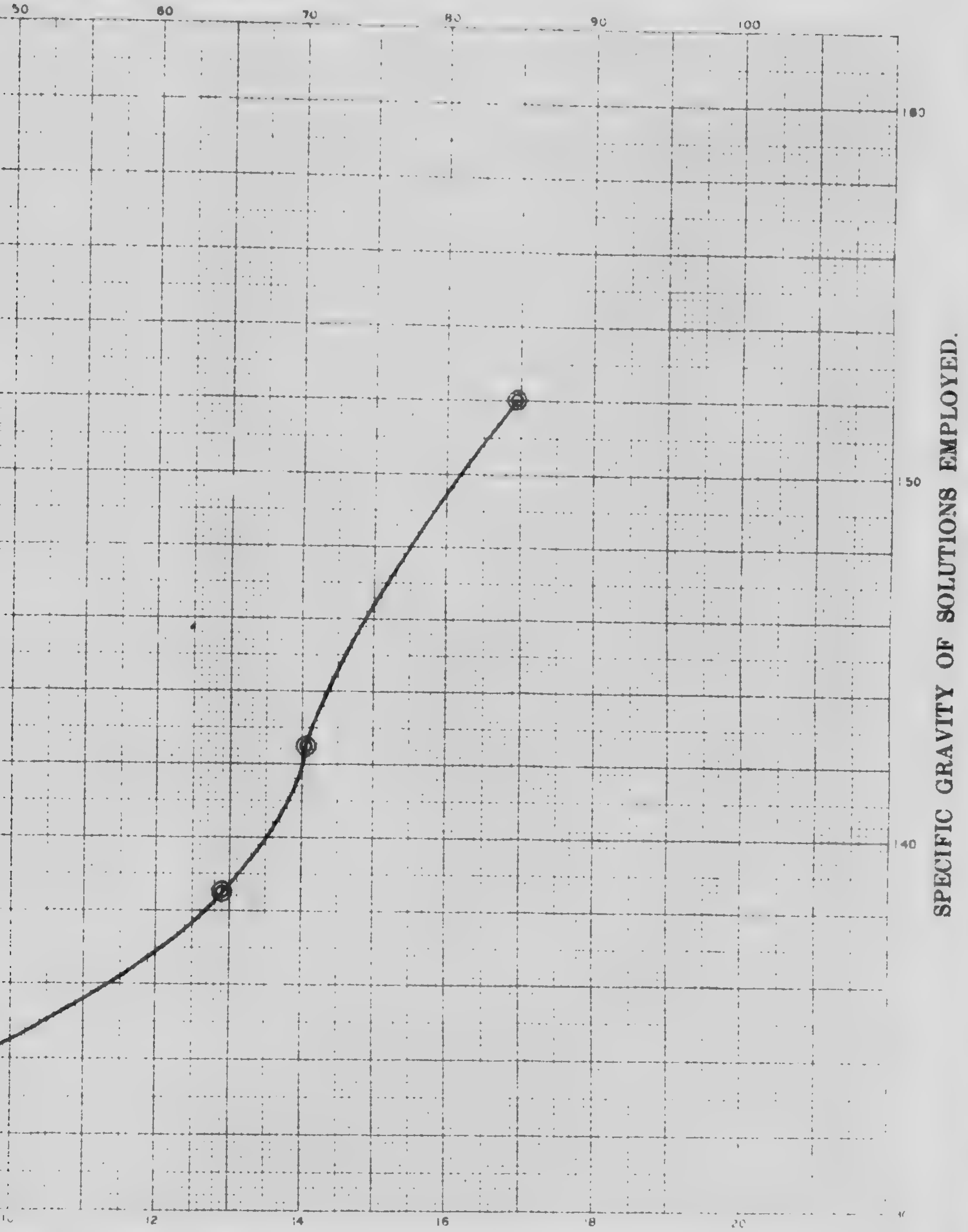


LEGEND: SYMBOLS.

△ Curve showing the relative quantities of the several sizes.
" " " " " " " densities.
– " " " percentage of ash in each of the several sizes.
◎ " " " " " " material floating at the several den

ZING AND SPECIFIC GRAVITY TESTS.

E OF SIZE AND OF FLOAT.



ASH IN SIZE AND IN FLOAT.

COAL No 7
Appendix I. Vol. III

everal densities.

COAL.—No. 9.

Locality.—River Hebert, Cumberland county, N.S.

Colliery.—Minudie Coal Co., Minudie colliery.

Sample.—Six and a quarter tons were taken in approximately equal quantities from the 500, 800, 1,000, and 1,200 ft. levels, on both sides of the slope. The sample was of lump coal which had been passed over a ¾" screen and then hand picked. Sampled April 2, 1907.

TABLE A.

Specific Gravity Tests.

	Specific gravity of solution.	Float %	Ash in Float %	Sink %	Ash in Sink %
1.	1·52	75·5	5·8	24·5	43·0
2.	1·42	67·4	5·3	32·6	37·5
3.	1·375	57·2	4·6	42·8	.
4.	1·315	45·3	3·5	54·6	. .

The following results are obtained from the above data, and the chemists results :—

5.	Good coal, Sp. Gr. under 1·375	% yield	57·2	% ash	4·6
6.	Bone coal, Sp. Gr. 1·375 to 1·55	" "	19·1	" "	9·7
7.	Useful coal—sum of (5) and (6)	" "	76·3	" "	5·9
8.	Refuse, Sp. Gr. over 1·55	" "	23·7	" "	45·0
9.	Assay of original sample raw coal as sent to chemist			" "	15·5
10.	" " " " " "			% sulphur	6·7
11.	" " " " " "			Fuel Ratio	1·37
12.	Assay of mixed good and bone coal (5) and (6)			" "	....

Remarks.—This coal has a medium proportion of innate ash and a large proportion of bone and refuse, both low in ash. The coal is a difficult one to wash, owing to its physical character, but under careful treatment it should be considerably improved as regards ash. The sulphur is largely innate and cannot be materially reduced.

TABLE B.

Screen Analysis.

	Maximum Screen MM.	Minimum Screen MM.	Mean MM.	% of whole sample	% Ash in size.
13.	6·34	3·16	4·75	....	. .
14.	3·16	1·20	2·18		....
15.	1·20	0·64	0·92		. .
16.	0·64	0·30	0·47		.
17.	0·30	0·173	0·24		. .
18.	0·173	0·000	0·086		

Remarks.—No screen analyses were made.

TABLE C

Results of Washing (Details of Sizes).

	Original coal and its products	Sizes between 1″ and ½″ Total wt. lbs.	Ash %	Sizes between ½″ and ⅛″ Total wt. lbs.	Ash %	Sizes under ⅛″ Total wt. lbs.	Ash %
19	Original coal	43·25	19·0*	16·26	15·2*		
20	Washed coal	37·27	12·8	12·08	10·0		
21	Refuse—coarse						
22.	Hutch product						
23.	Jig slimes						
24	Table slimes						

TABLE D.

Results of Washing (Totals).

25.	Original coal	wt. in lbs.	5951	% ash	15·5	% sulphur	6·7
26.	Washed coal	" "	4935	" "	11·0	" "	6·3
27.	Refuse	" "	730	" "	49·5	" "	. .
28.	Other products	" "	120	" "	26·7	" "	. .
29.	Loss	" "	166	" "	.	" "	. . .
30.	Loss in % 2·8.						

TABLE E.

Summary Statement of Effect of Washing on Fuel Values.

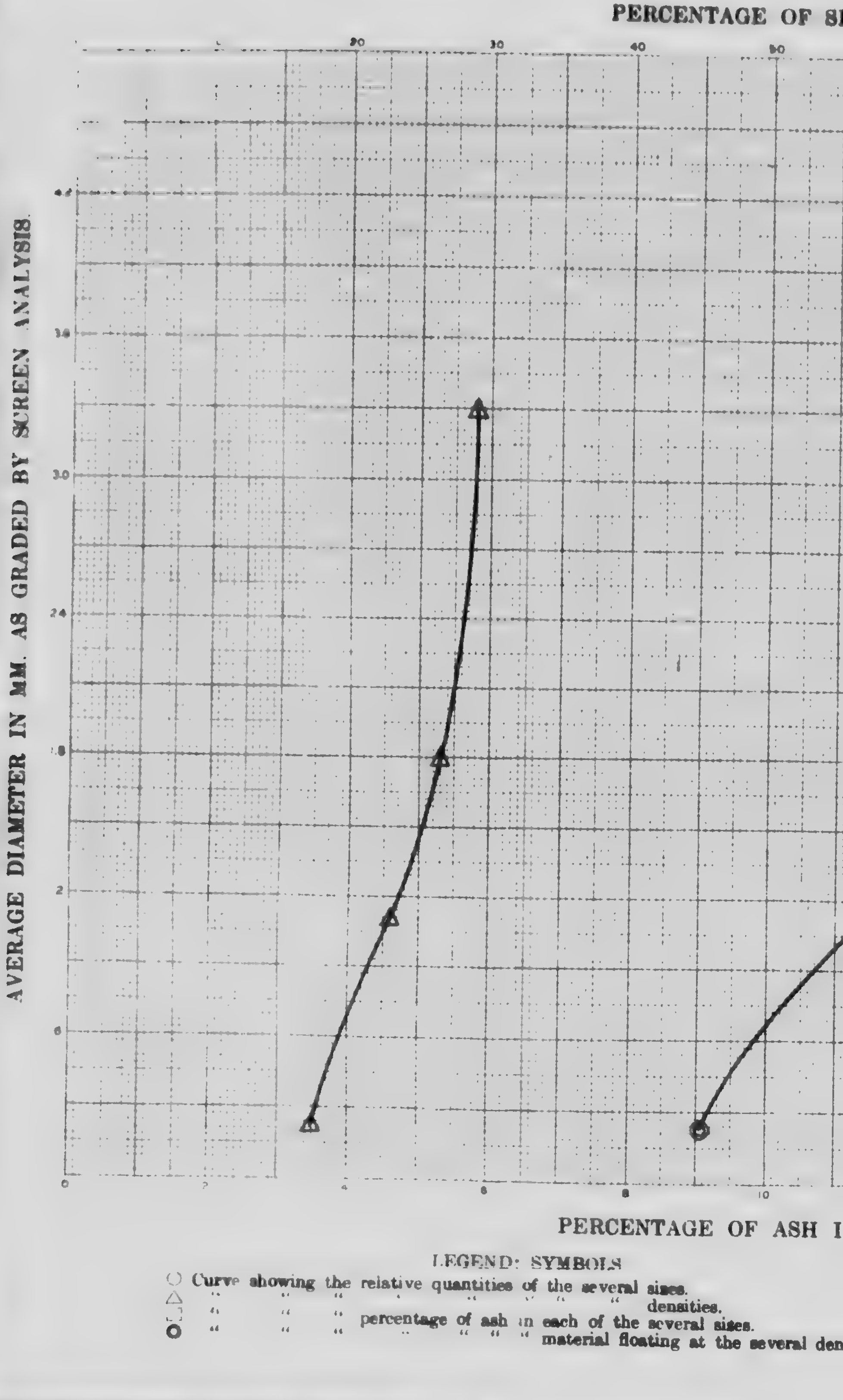
31.	Recovery of washed coal, including good bone	%	79·4	Ratio to standard	104·1
32.	Reduction in ash	%	29·0	" "	53·7
33.	" " sulphur	%	6·0	" "	14·3
34.	Increase in calorific value—calorimeter	%	6·5		
35.	Increase in evaporation under boiler	%	9·3		
36.	Decrease in clinker under boiler	%	3·6		
37.	Fuel ratio of original coal		1·37		
38.	" " washed "		1·38		
39.	Calorific value of original coal		6570		
40.	" " washed "		7000		

Remarks on Tables C, D, and E.—This coal was the first one washed in the regular series, and for this reason, as well as because of its extremely difficult character, the main test was preceded by a preliminary run, the two being carried out under somewhat different conditions. In the preliminary tests, the coal was crushed to 1″ and made into three sizes, of which the large and medium only were washed, the fines being discarded. In the second test, the coal was also crushed to 1″, but only two sizes were made—coarse and fine, both being washed. The washed coal from both tests was mixed for analysis and the results published above are made up from the combined products. The result of the washing does not compare at all favourably with the results of the specific gravity tests, owing to the fact that the impurities in this coal are distributed in numerous, very thin streaks, so that it is scarcely possible to find any lumps of really clean coal. The washing was necessarily done of comparatively coarse material; that is to say, from 1″, whereas the specific gravity tests were made with a coal which had been all crushed to very fine powder.

If the coal were suitable for coking, it could, of course, be crushed fine before washing, and thus a much greater improvement could be effected, but the high proportion of organic sulphur renders coking out of the question, and washing merely for fuel purposes does not seem to be justifiable.

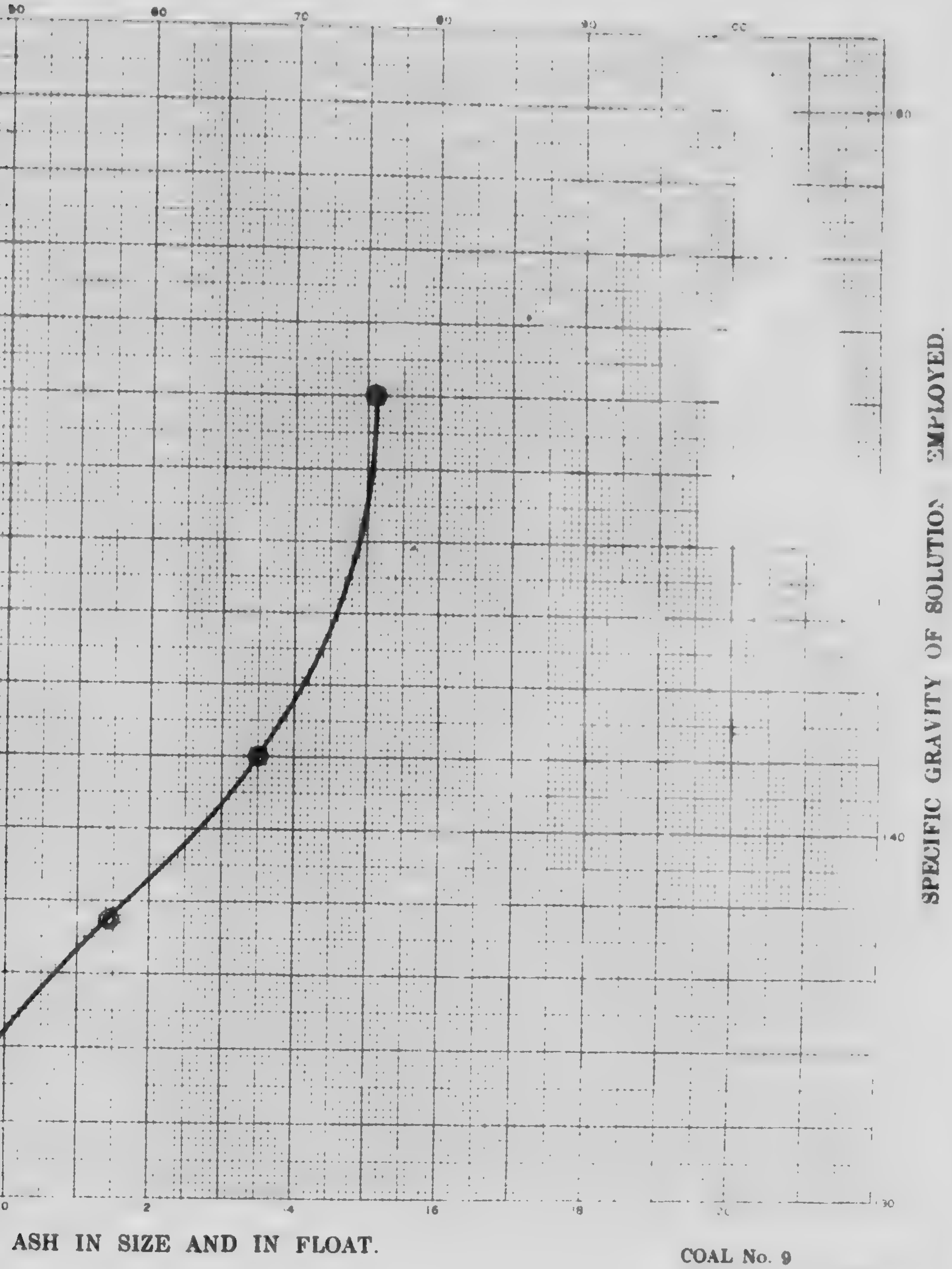
AVERAGE DIAMETER IN MM. AS GRADED BY SCREEN ANALYSIS
1.8
2.4

GRAPHIC RECORD OF SIZING A



ING AND SPECIFIC GRAVITY TESTS.

OF SIZE AND OF FLOAT.



COAL No. 9
Appendix I Vol. III

everal densities.

COAL N[illegible]

Locality.—Joggins, Cumberland county, N.S.

[illegible] Co. Joggins colliery, Joggins mine.

Sample.—About six tons were taken from the 3,100 ft. level, both east and west of the main slope. The sample consisted of lump coal which had been passed over a ¾" screen and then hand picked. Sampled April 3, 1907.

TABLE A

Specific Gravity Tests.

	Specific gravity of solution	Float %	Ash in Float %	Sink %	Ash in Sink %
1.	1·550	78·5	7·8	21·5	53·0
2.	1·435	72·0	7·2	28·0	42·9
3.	1·360	57·0	5·6	43·0	
4.	1·325	28·0	5·5	72·0	22·[illegible]

The following results are obtained from the above data, and the chemist's re[illegible]

5. Good coal, Sp. Gr. under 1·375 .... % yield 61·5 %, ash 6·4
6. Bone coal, Sp. Gr. 1·375 to 1·55 .... " " 17·0 " " 13·0
7. Useful coal—sum of (5) and (6) .... " " 78·5 " " 7·8
8. Refuse, Sp. Gr. over 1·55 .... " " 21·5 " " 53·0
9. Assay of original sample raw coal as sent to chemist .... " " 18·6
10. " " " " " " .... % sulphur 5·4
11. " " " " " " .... Fuel Ratio 1·22
12. Assay of mixed good and bone coal (5) and (6) .... "

Remarks.—This coal has a high proportion of innate ash, a medium proportion of bone, rather low in ash, and a large proportion of refuse. It is somewhat difficult coal to wash, but by suitable treatment the ash can be considerably reduced and the sulphur somewhat lowered.

TABLE B

Screen Analysis.

	Maximum Screen MM.	Minimum Screen MM.	Mean MM.	% of whole sample	% Ash in size
13.	6·34	3·16	4·75		
14.	3·16	1·20	2·18		....
15.	1·20	0·64	0·92		
16.	0·64	0·30	0·47		
17.	0·30	0·173	0·24		
18.	0·173	0·000	0·086		

Remarks.—No complete series of screen analyses was made, but enough work was done to show that the refuse is softer than the coal, and that the screenings are, therefore, high in ash.

TABLE C.

Results of Washing (Details of Sizes).

	Original coal and its products.	Sizes between 1" and ½" Total wt. lbs.	Ash. %	Sizes between ½" and ⅛" Total wt. lbs.	Ash. %	Sizes under ⅛" Total wt. lbs.	Ash. %
19.	Original coal ...	3360	15·8	1340	15·3	500	20·7
20.	Washed coal....	2717	11·1	986	8·6	390	19·5
21.	Refuse—coarse..	....	....	....	....	....	....
22.	Hutch product .	...	..	.	...	...	...
23.	Jig slimes. ..	.	.		..	.	....
24.	Table slimes. .	..			...	.	....

TABLE D.

Results of Washing (Totals).

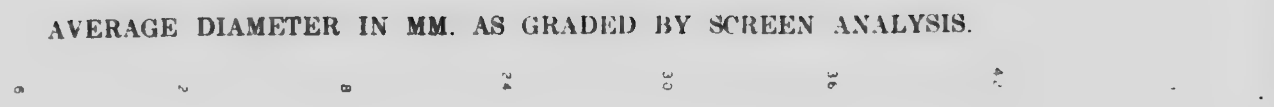
25.	Original coal.........................	wt. in lbs. 5200	% ash	18·6	% sulphur	5·4
26.	Washed coal.........................	" " 4093	" "	10·3	" "	4·8
27.	Refuse...........................	" " 983	" "	46·0	" "	....
28.	Other products........................	" " 60	" "	15·1	" "	....
29.	Loss............................	" " 64	" "	....	" "	....
30.	Loss in % 1·2.					

TABLE E.

Summary Statement of Effect of Washing on Fuel Values.

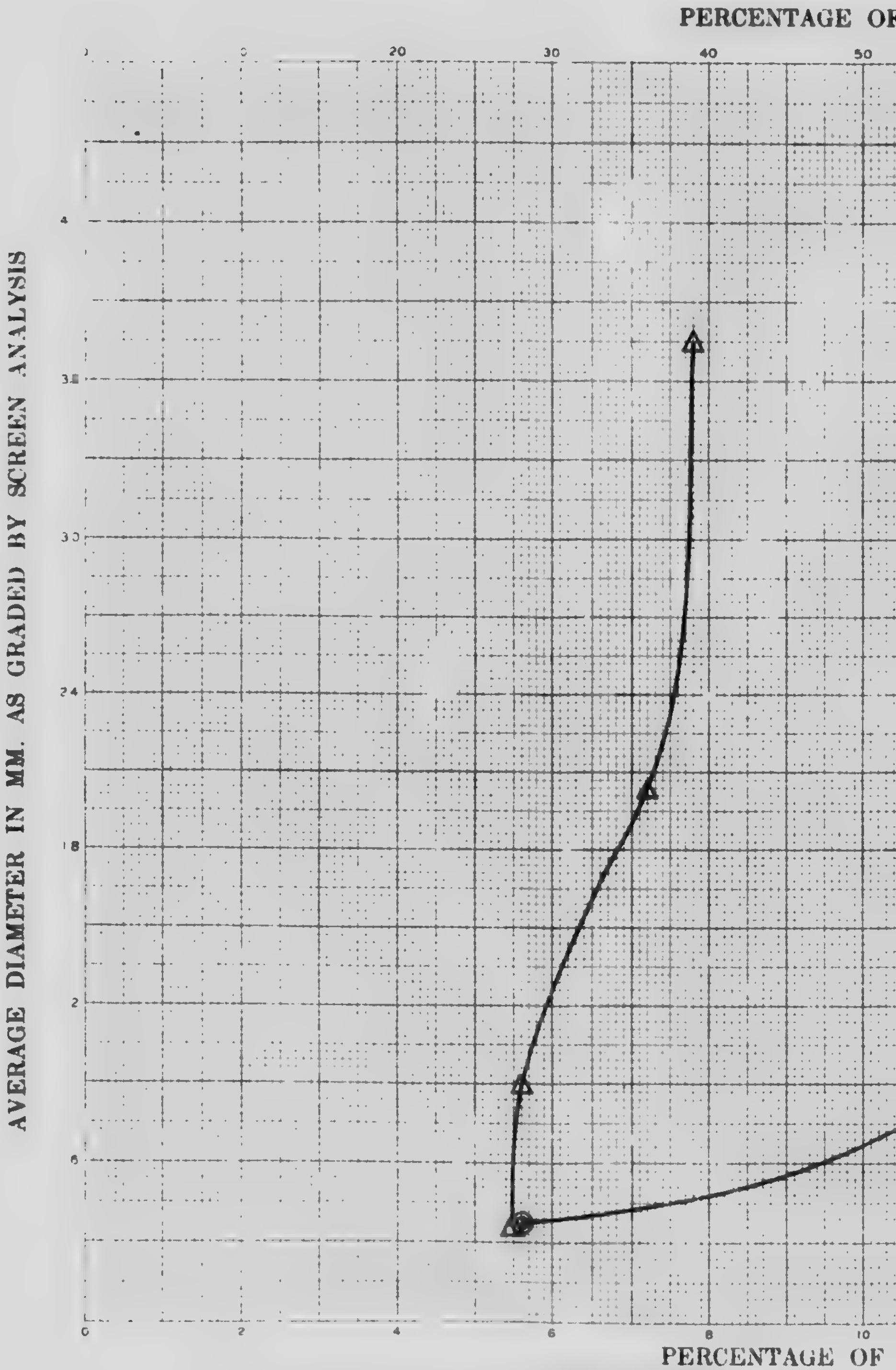
31.	Recovery of washed coal, including good bone...%	78·7	Ratio to standard	100·2
32.	Reduction in ash...........................%	44·6	" "	75·7
33.	" " sulphur...........................%	11·2	" "	46·1
34.	Increase in calorific value—calorimeter.........%	9·9		
35.	Increase in evaporation under boiler...........%	10·8		
36.	Decrease in clinker under boiler................%	53·6		
37.	Fuel ratio of original coal....................	1·22		
38.	" " washed "	1·38		
39.	Calorific value of original coal.................	6440		
40.	" " washed "	7080		

Remarks on Tables C, D, and E.—The procedure adopted in washing was normal, except that the finest size was jigged on a bed of refuse from the screened size. The results of the washing compare fairly well with those of the specific gravity tests, although the recovery of washed coal is less and the refuse contains less ash than would be the case in a continuous commercial operation. Attention should be called to the distribution of ash in this coal, the smaller sizes showing a very high ash content. The coal is unsuitable for the manufacture of coke, owing to its high organic sulphur, which cannot be removed by washing, and although its steaming qualities are improved, and the proportion of ash and clinker greatly reduced, it is improbable that there is commercial justification for washing. It is, however, quite possible that the screenings from this coal might be washed with advantage.



AVERAGE DIAMETER IN MM. AS GRADED BY SCREEN ANALYSIS.
6
2
8
24
30
36
4

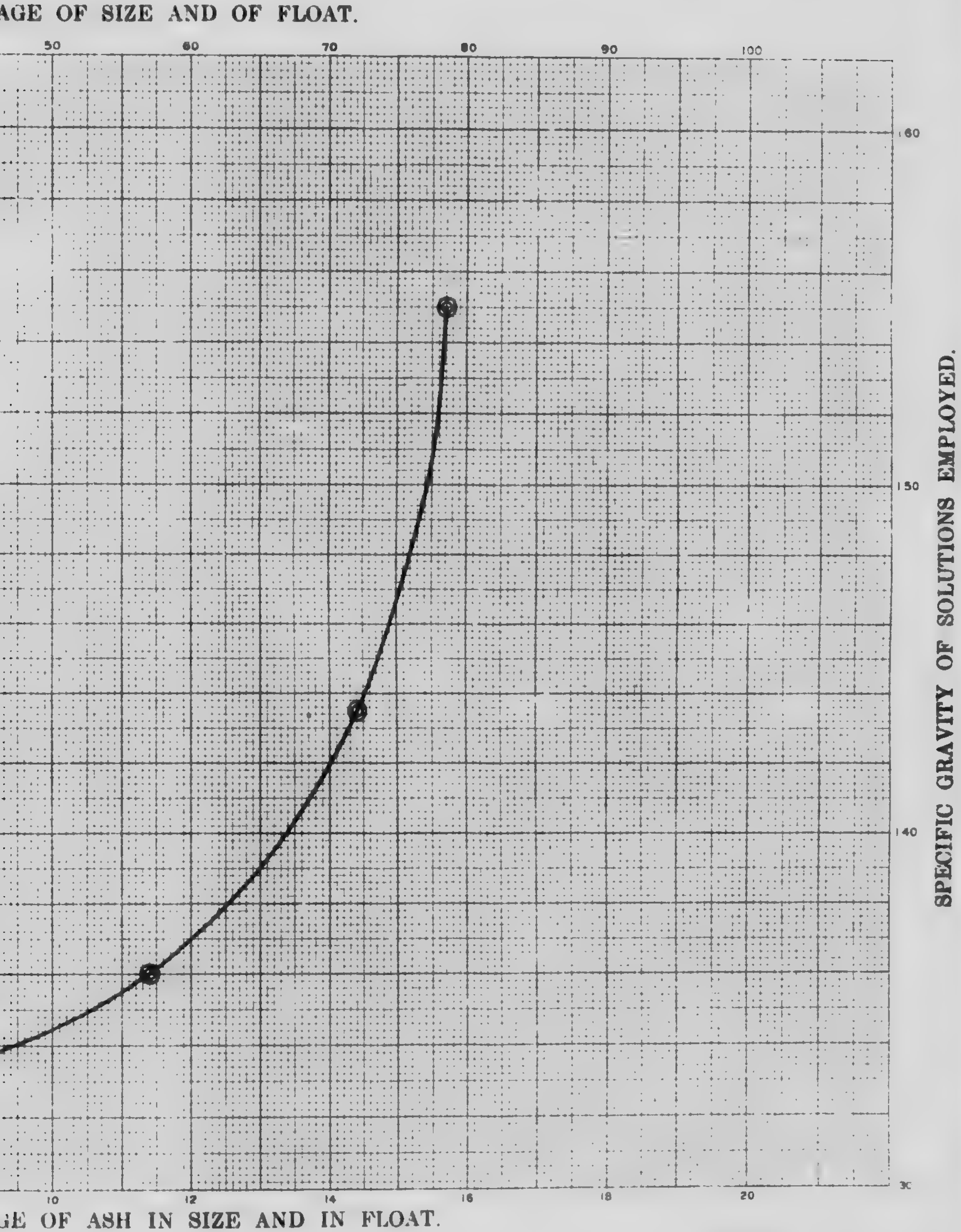
GRAPHIC RECORD OF SIZIN



LEGEND: SYMBOLS.

○ Curve showing the relative quantities of the several sizes.
△ " " " " " " " " densities.
+ " " " percentage of ash. in each of the several sizes.
⊙ = " " " " " " material floating at the sev

SIZING AND SPECIFIC GRAVITY TESTS.



COAL No. 10
Appendix I. Vol. III

ties.
al sizes.
at the several densities.

GRAND LAKE COAL FIELD.

QUEENS CO., NEW BRUNSWICK.

ERRATUM

On the curve diagrams accompanying the tabulated records of each of the coals tested, is the following legend:—

LEGEND: SYMBOLS

○ Curve showing the relative quantities of the several sizes
△ " " " " " " " " densities.
□ " " " percentage of ash in each of the several sizes.
◉ " " " " " " material floating at the several densities.

The above legend is incorrect; in each case it should read thus:—

○ Curve showing the relative quantities of the several sizes.
□ " " " percentage of ash in each of the several sizes.
◉ " " " " " material floating at the several densities.
△ " " " " " ash in " " " " " "

COAL.—No. 11.

Locality.—Minto, N.B.

Colliery.—King's mine.

Sample.—A sample of about eleven tons which consisted of lump coal, was taken from different parts of the mine. It was cleaned by passing over a ¾" screen, and was roughly hand picked during loading. April 8, 1907.

TABLE A.

Specific Gravity Tests.

	Specific gravity of solution.	Float %	Ash in Float %	Sink %	Ash in Sink %
1.	1·530	75·0	6·8	25·0	36·9
2.	1·430	65·7	5·9	34·5	
3.	1·370	55·7	4·3	44·3	27·3
4.	1·310	43·5	3·7	56·5	22·5

The following results are obtained from the above data, and the chemists results :—

5.	Good coal, Sp. Gr. under 1·375	% yield	56·8	% ash	4·1
6.	Bone coal, Sp. Gr. 1·375 to 1·55	" "	19·2	" "	15·1
7.	Useful coal—sum of (5) and (6)	" "	76·0	" "	6·9
8.	Refuse, Sp. Gr. over 1·55	" "	24·0	" "	38·6
9.	Assay of original sample raw coal as sent to chemist			" "	14·4
10.	" " " " " "			% sulphur	5·8
11.	" " " " " "			Fuel Ratio	1·66
12.	Assay of mixed good and bone coal (5) and (6)			" "	

Remarks.—This coal has a moderate proportion of innate ash, and a large proportion of bone and refuse, both low in ash. Washing will not improve it much, unless a very considerable proportion of the material is wasted as refuse. The sulphur is not materially reduced by washing.

TABLE B.

Screen Analysis.

	Maximum Screen MM.	Minimum Screen MM.	Mean MM.	% of whole sample	% Ash in size
13.	6·34	3·16	4·75		
14.	3·16	1·20	2·18		
15.	1·20	0·64	0·92		
16.	0·64	0·30	0·47		
17.	0·30	0·173	0·24		
18.	0·173	0·000	0·086		

Remarks.—No screen analyses were made.

TABLE C

Results of Washing (Details of Sizes).

	Original coal and its products.	Sizes between 1" and ½" Total wt. lbs.	Ash. %	Sizes between ½" and ⅛" Total wt. lbs.	Ash. %	Sizes under ⅛" Total wt. lbs.	Ash. %
19.	Original coal	4258	13·9	1357	13·2		....
20.	Washed coal	3590	10·[illegible]	1034	8·0		....
21.	Refuse—coarse				...		....
22.	Hutch product				...		....
23.	Jig slimes				...		....
24.	Table slimes				...		....

TABLE D.

Results of Washing (Totals).

25.	Original coal	wt. in lbs.	5615	% ash	14·4	% sulphur	5·8
26.	Washed coal	" "	4624	" "	9·4	" "	4·9
27.	Refuse	" "	862	" "	38·8	" "	....
28.	Other products	" "	40	" "	15·3	" "	....
29.	Loss	" "	89	" "	....	" "	....

30. Loss in % 1·6.

TABLE E.

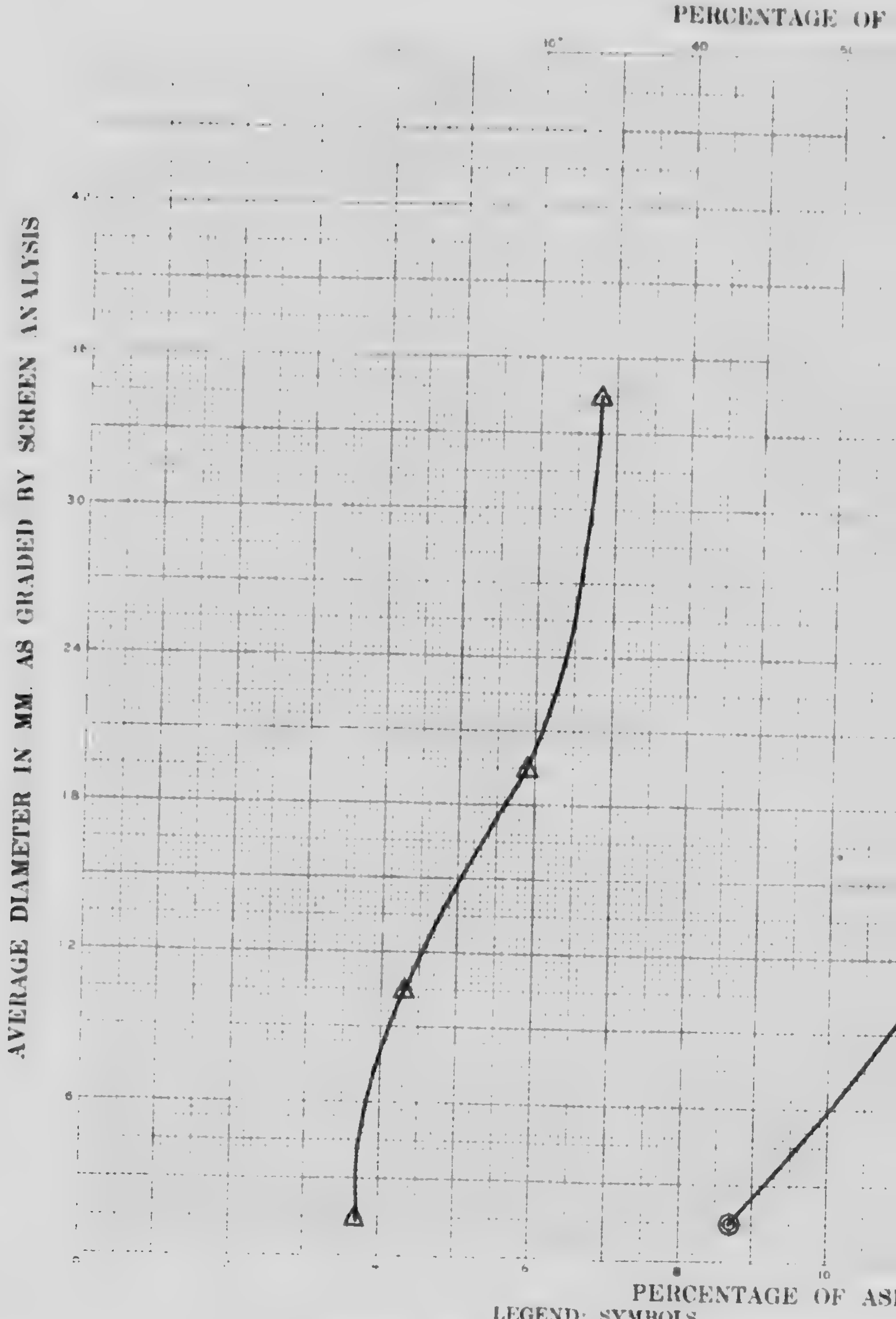
Summary Statement of Effect of Washing on Fuel Values.

31.	Recovery of washed coal, including good bone	%	82·4	Ratio to standard	107·1
32.	Reduction in ash	%	34·7	" "	73·4
33.	" " sulphur	%	15·5	" "	59·2
34.	Increase in calorific value—calorimeter	%	7·3		
35.	Increase in evaporation under boiler	%	13·7		
36.	Decrease in clinker under boiler	%	18·3		
37.	Fuel ratio of original coal		1·66		
38.	" " washed "		1·66		
39	Calorific value of original coal		7160		
40.	" " washed "		7680		

Remarks on Tables C, D, and E.—The procedure in washing differed from the normal in that only two sizes were made; *i.e.*, over and under ½", but the results of the trials agreed fairly well with those of the specific gravity tests. The coal is extremely compact and hard, and quite different in character from the other eastern coals, and it is doubtful whether the standard adopted for refuse is quite suitable in this case, as the ash in the material sinking at 1·55 specific gravity is unusually low. It is improbable, however, that even a change in the standard would result in a commercially successful washing, as the coal is unsuitable for coking on account of its high organic sulphur, and the improvement in fuel values is scarcely enough to justify treatment.

AVERAGE DIAMETER IN MM. AS GRADED BY SCREEN ANALYSIS.
0
6
18
24
30
36
42

GRAPHIC RECORD OF SIZING



LEGEND: SYMBOLS

○ Curve showing the relative quantities of the several sizes

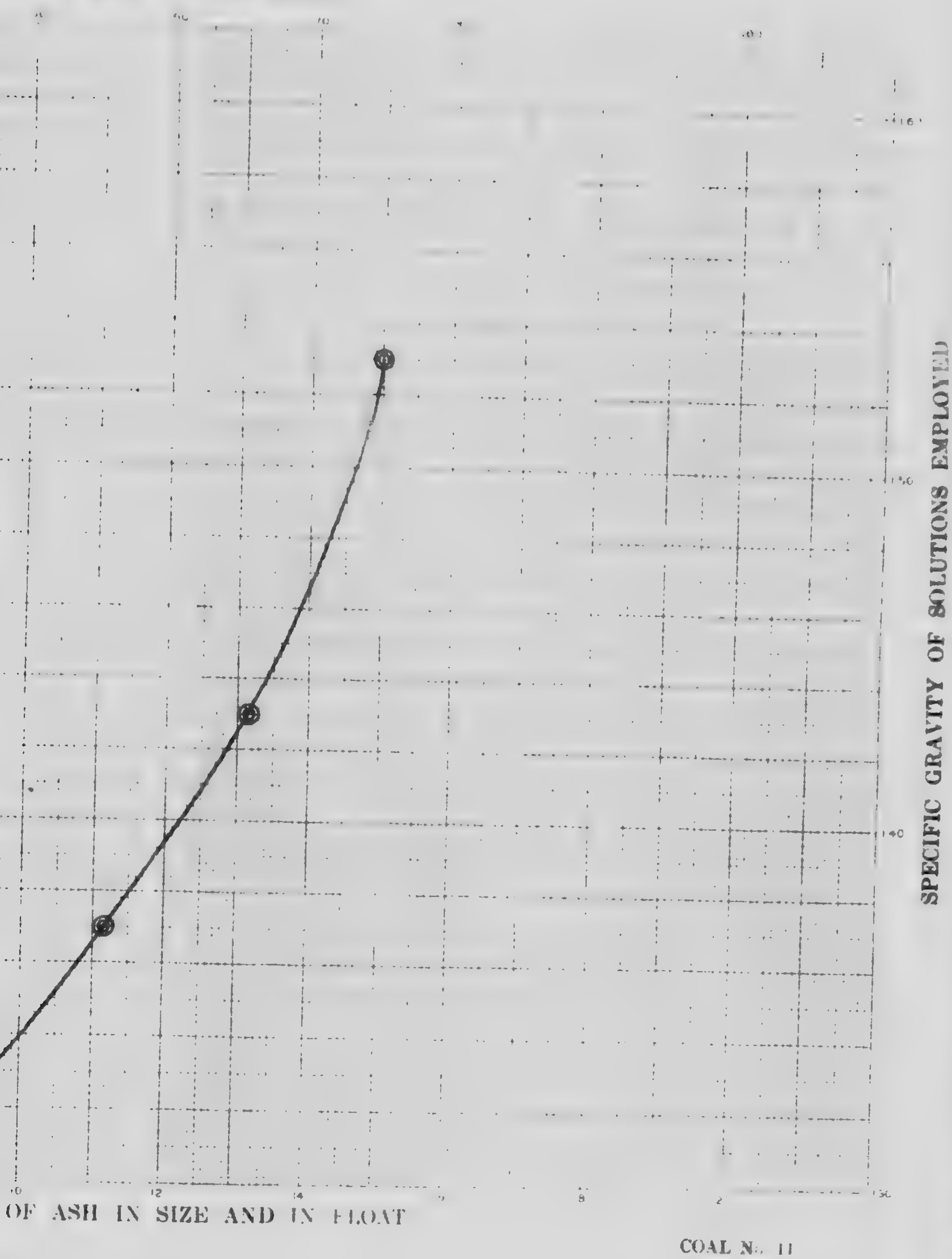
/ " " " " " " " " densities

△ " " " percentage of ash in each of the several sizes

◎ " " " " " " material floating at the several

IZING AND SPECIFIC GRAVITY TESTS

GE OF SIZE AND OF FLOAT



COAL No. 11
Appendix I Vol. III

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he several densities.

ALBERTA AND SASKATCHEWAN LIGNITE FIELDS.

SOURIS-ESTEVAN FIELD, SASK.

ERRATUM

On the curve diagrams accompanying the tabulated records of each of the coals tested, is the following legend:—

LEGEND: SYMBOLS

○ Curve showing the relative quantities of the several sizes.
△ " " " " " " " " densities.
□ " " " percentage of ash in each of the several sizes.
◐ " " " " " " " material floating at the several densities

The above legend is incorrect; in each case it should read thus:—

○ Curve showing the relative quantities of the several sizes.
□ " " " percentage of ash in each of the several sizes.
● " " " " " material floating at the several densities.
△ " " " " " ash in " " " [illegible]

COAL.—No. 40.

Locality.—Taylorton, Sask.

Colliery.—Western Dominion collieries.

Sample.—A sample of fifty sacks was taken from development work on July 11, 1908. An additional sample of seventy-five sacks was taken on August 23. The seam is very clean, and the coal is graded as domestic lump. Sampled July 11, 1908.

TABLE A.

Specific Gravity Tests.

	Specific gravity of solution.	Float %	Ash in Float %	Sink %	Ash in Sink %
1.	1·540	94·3	7·2	5·8	24·7
2.	1·430	21·8	7·0	78·2	10·5
3.	1·380	3·4	....	96·6	8·9
4.	1·330	....	....	100·0	8·2

The following results are obtained from the above data, and the chemists reports :

5. Good coal, Sp. Gr. under 1·375 .... % yield .... % ash
6. Bone coal, Sp. Gr. 1·375 to 1·55 .... " " 95·0 " " 7·2
7. Useful coal—sum of (5) and (6) .... " " 95·0 " " 7·2
8. Refuse, Sp. Gr. over 1·55 .... " " 5·0 " " 25·0
9. Assay of original sample raw coal as sent to chemist .... " " 8·1
10. " " " " " " .... % sulphur 0·6
11. " " " " " " .... Fuel Ratio 0·88
12. Assay of mixed good and bone coal (5) and (6) .... " " 0·74

Remarks.—This sample is a heavy and homogeneous lignite, which would be but little improved by washing.

TABLE B.

Screen Analysis.

	Maximun Screen MM.	Minimum Screen MM.	Mean MM.	% of whole sample	% Ash in size
13.	6·34	3·16	4·75	37·5	6·5
14.	3·16	1·20	2·18	27·4	7·2
15.	1·20	0·64	0·92	14·6	6·4
16.	0·64	0·30	0·47	8·2	6·4
17.	0·30	0·173	0·24	6·4	7·5
18.	0·173	0·000	0·086	5·9	9·0

Pemarks.—The coal is fairly homogeneous, but contains a small amount of weak refuse material. The coal itself is of medium strength when freshly mined, but gives up its water and crumbles if left for any length of time exposed to the air.

TABLE C

Results of Washing (Details of Sizes).

	Original coal and its products.	Sizes between 1″ and ½″ Total wt. lbs.	Ash. %	Sizes between ½″ and ⅛″ Total wt. lbs.	Ash. %	Sizes under ⅛″ Total wt. lbs.	Ash. %
19.	Original coal	This lignite was not washed.					
20.	Washed coal						
21.	Refuse—coarse						
22.	Hutch product						
23.	Jig slimes						
24	Table slimes						

TABLE D

Results of Washing (Totals).

25.	Original coal	wt. in lbs.	% ash	% sulphur
26.	Washed coal	" "	" "	" "
27.	Refuse	" "	" "	" "
28.	Other products	" "	" "	" "
29.	Loss	" "	" "	" "
30.	Loss in %			

TABLE E.

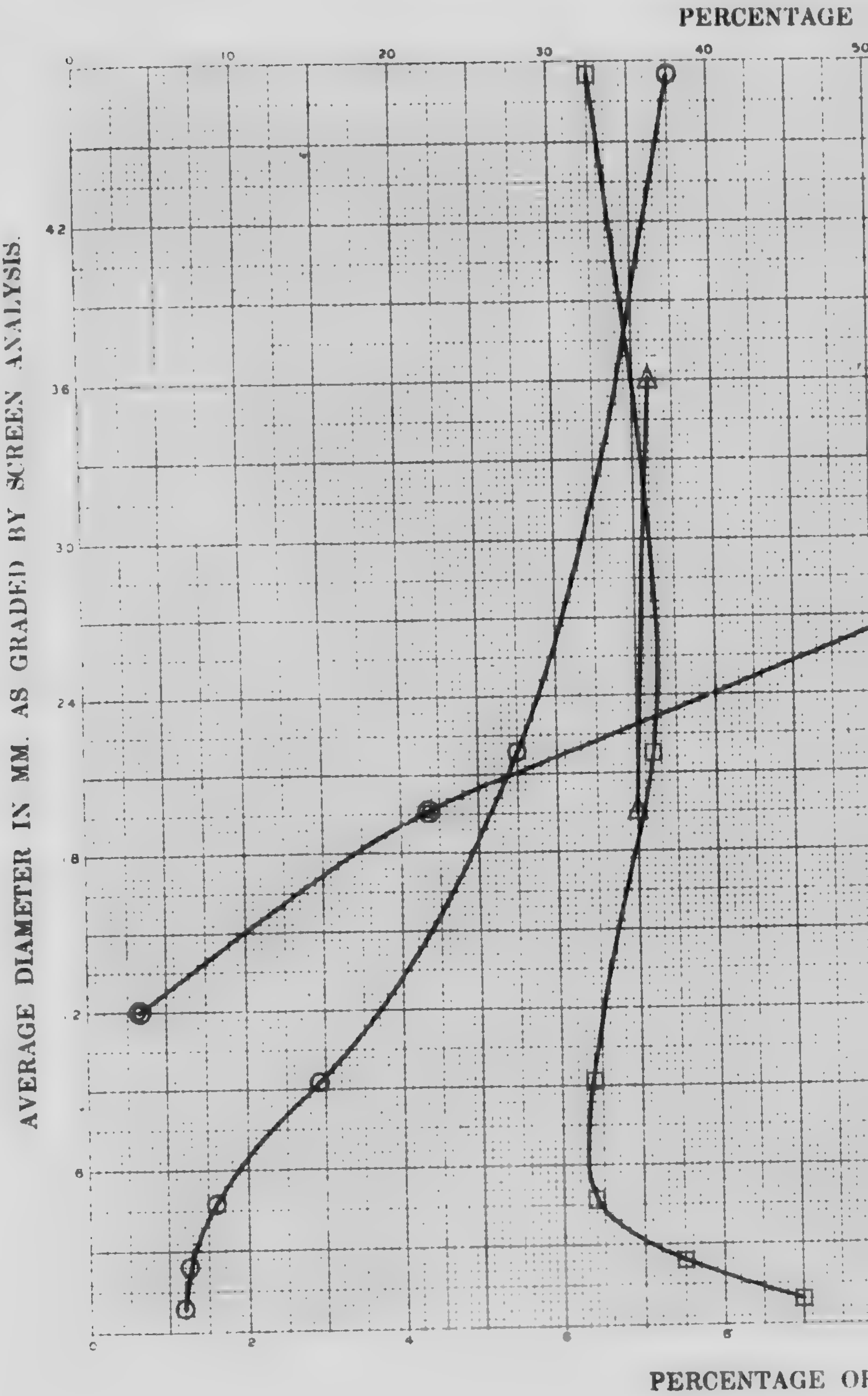
Summary Statement of Effect of Washing on Fuel Values.

31.	Recovery of washed coal, including good bone	%	Ratio to standard
32.	Reduction in ash	%	" "
33.	" " sulphur	%	" "
34.	Increase in calorific value—calorimeter	%	
35.	Increase in evaporation under boiler	%	
36.	Decrease in clinker under boiler	%	
37	Fuel ratio of original coal		
38.	" " washed "		
39.	Calorific value of original coal		
40.	" " washed "		

Remarks on Tables C, D, and E.—None of the lignites were washed.

AVERAGE DIAMETER IN MM. AS GRADED BY SCREEN ANALYSIS.
6
.2
4.2

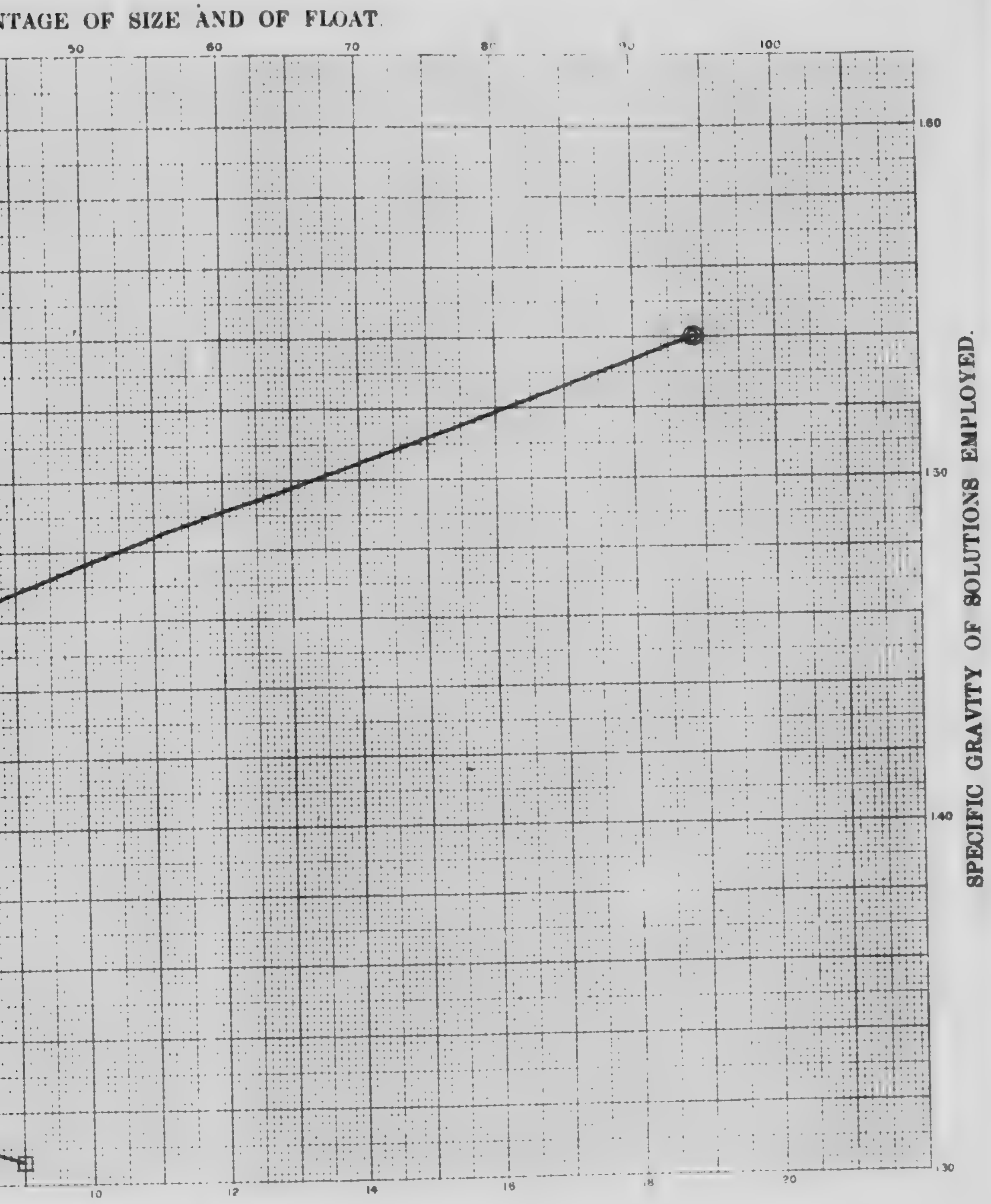
GRAPHIC RECORD OF SIZI



LEGEND: SYMBOLS.

○ Curve showing the relative quantities of the several sizes.
△ " " " " " " " densities.
□ " " " percentage of ash in each of the several sizes.
⊙ " " " " " " " material floating at the s

SIZING AND SPECIFIC GRAVITY TESTS



COAL No. 40
Appendix I, Vol. III

es.
nsities.
veral sizes.
g at the several densities.

COAL.—No. 41.

Locality.—Estevan, Sask.

Colliery.—Eureka Coal and Brick Co.

Sample.—A sample of twenty-five sacks was taken from the cars as they were loaded. There is no equipment for screening, and the coal is a good quality of run of mine. Sampled July 11, 1908.

TABLE A.

Specific Gravity Tests.

	Specific gravity of solution.	Float %	Ash in Float %	Sink %	Ash in Sink %
1.	1·520	48·0	8·0	52·0	21·8
2.	1·410	16·5	3·0	83·4	16·8
3.	1·370	0·0	....	100·0	16·3
4.	1·320	0·0	....	100·0	16·1

The following results are obtained from the above data, and the chemists results :—

5.	Good coal, Sp. Gr. under 1·375	% yield	% ash	
6.	Bone coal, Sp. Gr. 1·375 to 1·55	" "	" "	
7.	Useful coal—sum of (5) and (6)	" "	" "	
8.	Refuse, Sp. Gr. over 1·55	" "	" "	
9.	Assay of original sample raw coal as sent to chemist		" "	16·8
10.	" " " " " "		% sulphur	0·5
11.	" " " " " "		Fuel Ratio	1·08
12.	Assay of mixed good and bone coal (5) and (6)		" "	0·98

Remarks.—This coal is of exceedingly high specific gravity, and is virtually all bone if classified by the same standards as bituminous coal. The amount of actual refuse is, however, very low, and washing would be quite useless.

TABLE B

Screen Analysis.

	Maximun Screen MM.	Minimum Screen MM.	Mean MM.	% of whole sample	% Ash in size
13.	6·34	3·16	4·75	56·3	11·4
14.	3·16	1·20	2·18	23·4	12·4
15.	1·20	0·64	0·92	10·2	13·2
16.	0·64	0·30	0·47	4·6	14·4
17.	0·30	0·173	0·24	2·9	15·7
18.	0·173	0·000	0·086	2·6	18·9

Remarks.—This lignite is reasonably strong when mined, and stands handling and shipment very well, but it crumbles to dust on prolonged exposure to the air, owing to the drying out of the moisture.

TABLE C

Results of Washing (Details of Sizes).

	Original coal and its products.	Sizes between 1" and ½" Total wt. lbs.	Ash. %	Sizes between ½" and ¼" Total wt. lbs.	Ash. %	Sizes under ¼" Total wt. lbs	Ash. %
19	Original coal	This lignite was not washed.					
20	Washed coal						
21.	Refuse—coarse.						
22	Hutch product						
23	Jig slimes						
24	Table slimes						

TABLE D.

Results of Washing (Totals).

25. Original coal .... wt. in lbs. .... % ash ... % sulphur ....
26. Washed coal.. .... " " .... " " ... " " ...
27. Refuse.......... .... " " .... " " ... " " ..
28. Other products...... .... " " .... " " " " ....
29. Loss .... " " .... " " . " " .
30. Loss in %

TABLE E.

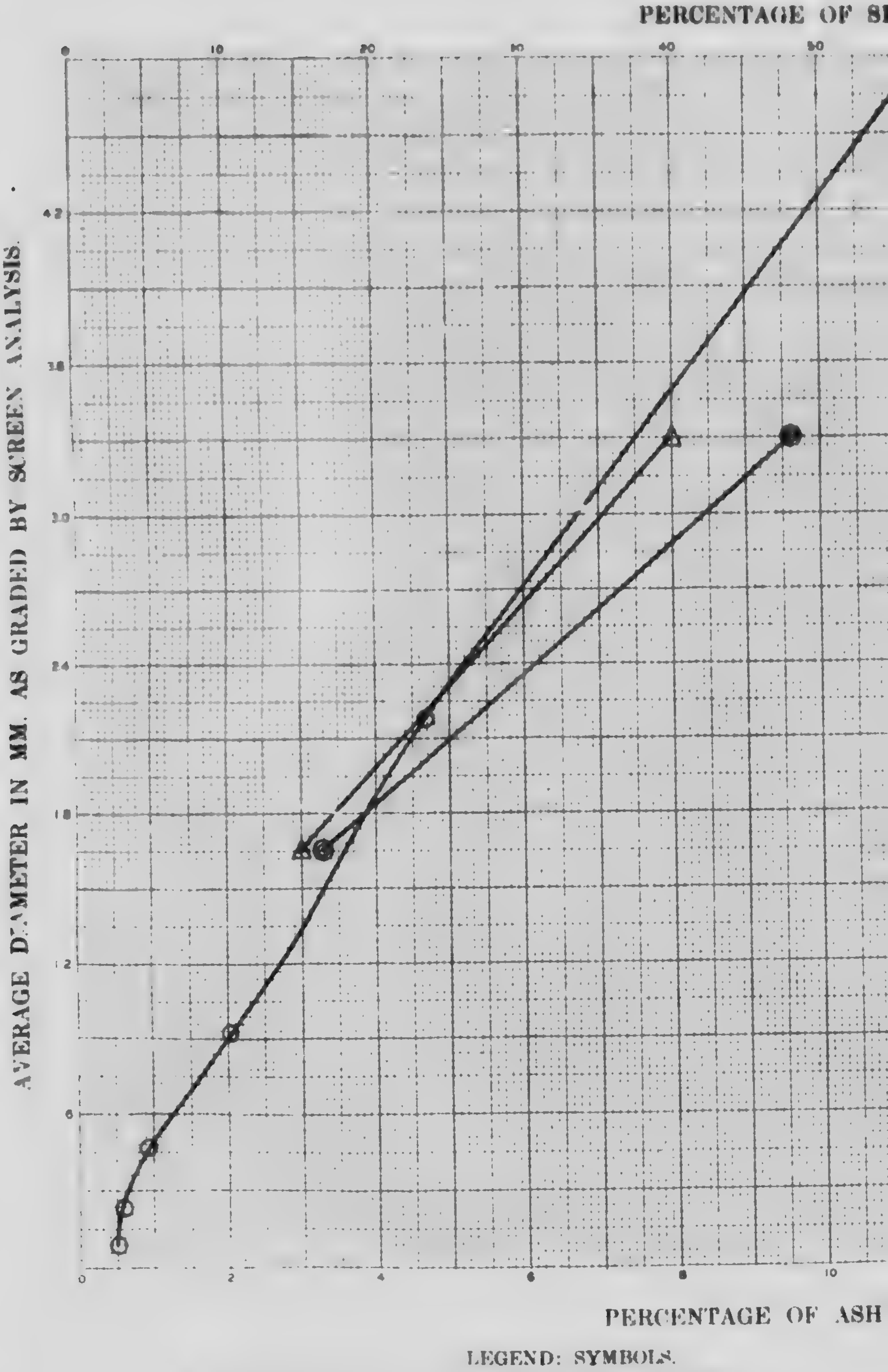
Summary Statement of Effect of Washing on Fuel Values.

31. Recovery of washed coal, including good bone....% ... Ratio to standard .
32. Reduction in ash ....% .. " " .
33. " " sulphur. .. ..% " " ..
34. Increase in calorific value—calorimeter.. .. .... %
35. Increase in evaporation under boiler.......... .... %
36. Decrease in clinker under boiler ....%
37 Fuel ratio of original coal.
38. " " washed "
39 Calorific value of original coal
40. " washed "

Remarks on Tables C, D and E.—None of the lignites were washed.

AVERAGE DIAMETER IN MM. AS GRADED BY SCREEN ANALYSIS.

GRAPHIC RECORD OF SIZING A

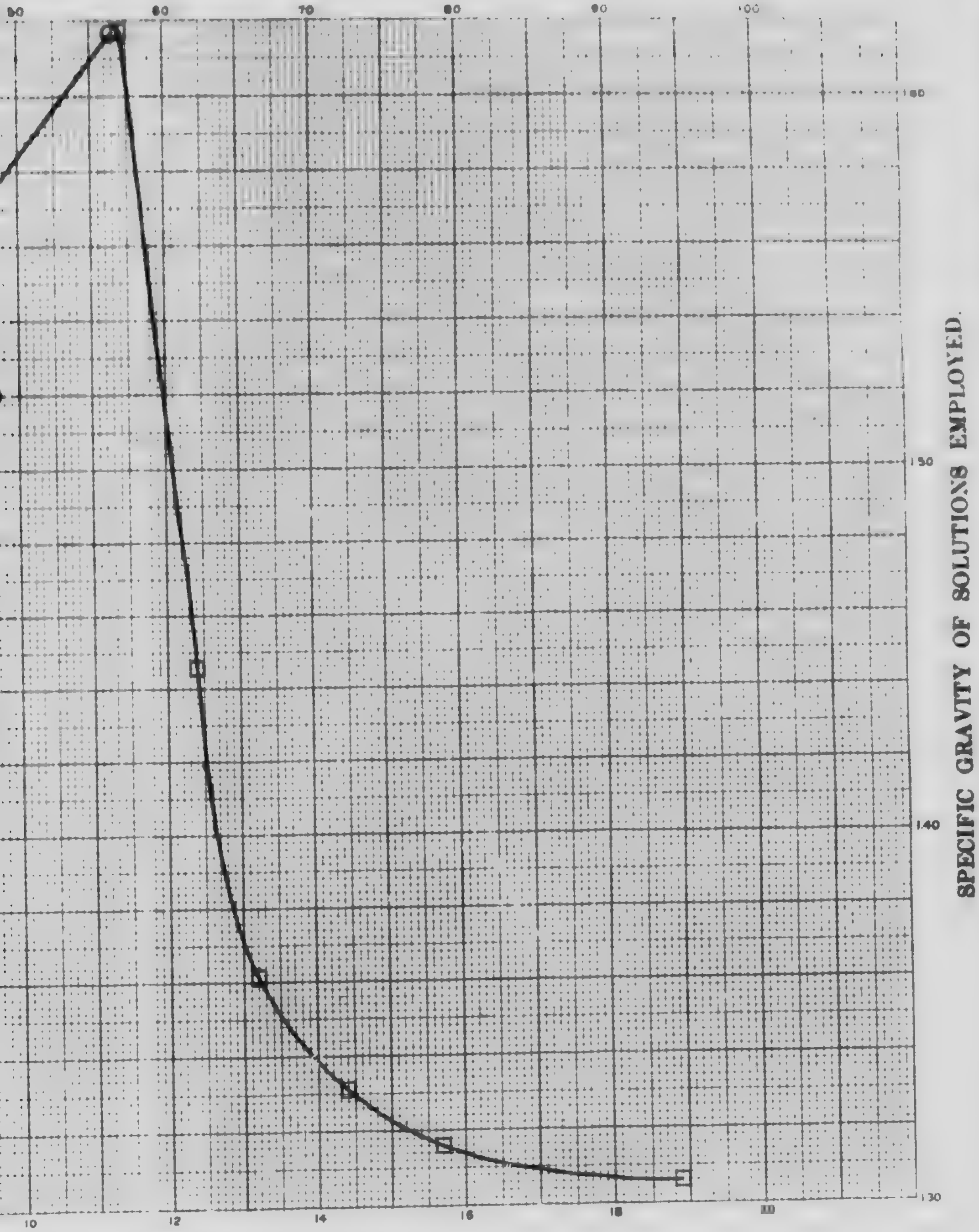


LEGEND: SYMBOLS.

○ Curve showing the relative quantities of the several sizes.
△ " " " " " " " " densities.
□ " " " percentage of ash in each of the several sizes
O " " " " " " " material floating at the several c

SING AND SPECIFIC GRAVITY TESTS.

OF SIZE AND OF FLOAT.



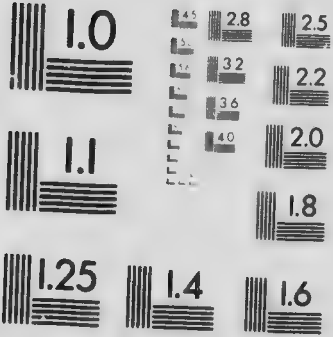
OF ASH IN SIZE AND IN FLOAT.

COAL No. 41
APPENDIX I, VOL. III

es
e several densities.

MICROCOPY RESOLUTION TEST CHART

ANSI and ISO TEST CHART No 2



APPLIED IMAGE Inc

EDMONTON FIELD, ALBERTA.

ERRATUM

On the curve diagrams accompanying the tabulated records of each of the coals tested, is the following legend:—

LEGEND: SYMBOLS

◇ Curve showing the relative quantities of the several sizes
△ " " " " " " " densities
□ " " percentage of ash in each of the several sizes
○ " " " " " material floating at the several densities

The above legend is incorrect; in each case it should read thus:

◇ Curve showing the relative quantities of the several sizes
□ " " " percentage of ash in each of the several sizes
○ " " " " " material floating at the several densities
△ " " " " " ash in " " " "

COAL.—No. 48.

Locality. Strathcona, Alberta.

Colliery. Strathcona Coal Co.

Sample.—The sample of twenty-five sacks was drawn from the bin, ten sacks being of nut coal, screened over 1½" bars, and fifteen sacks of lump coal over 2½" bars. The coal is drawn from the north side of the shaft about one hundred feet from the outcrop. It is stated to be of poorer quality than that south of the shaft, but it was impossible to secure a sample of the latter. Sampled July 16, 1908.

TABLE A.

Specific Gravity Tests.

	Specific gravity of solution.	Float %	Ash in Float %	Sink %	Ash in Sink %
1.	1·525	89·2	7·5	10·8	14·4
2.	1·410	36·5	5·8	63·5	14·5
3.	1·370	1·1		98·9	12·3
4.	1·325	0·0		100·0	11·6

The following results are obtained from the above data, and the chemists results :—

		% yield		% ash	
5.	Good coal, Sp. Gr. under 1·375				
6.	Bone coal, Sp. Gr. 1·375 to 1·55	" "	97·0	" "	7·8
7.	Useful coal—sum of (5) and (6)	" "	97·0	" "	7·8
8.	Refuse, Sp. Gr. over 1·55	" "	3·0	" "	57·8
9.	Assay of original sample raw coal as sent to chemist			" "	11·4
10.	" " " " "			% sulphur	0·4
11.	" " " " "			Fuel Ratio	1·16
12.	Assay of mixed good and bone coal (5) and (6) above			" "	1·19

Remarks.—This coal, like the other Alberta lignites, is not suitable for washing, although it could be improved more than the others from the same district.

TABLE B.

Screen Analysis.

	Maximum Screen MM.	Minimum Screen MM.	Mean MM.	% of whole sample	% Ash in size.
13.	6·31	3·16	4·75	47·8	10·0
14.	3·16	1·20	2·18	27·2	9·2
15.	1·20	0·64	0·92	14·0	9·8
16.	0·64	0·30	0·47	5·6	9·4
17.	0·30	0·173	0·24	3·1	10·5
18.	0·173	0·000	0·086	1·9	16·1

Remarks.—This coal is very similar to the other lignites. It is not at all friable when fresh, and the refuse seems to be somewhat weaker than the coal itself.

TABLE C.

Results of Washing (Details of Sizes).

	Original coal and its products.	Sizes between 1" and ½" Total wt. lbs.	Ash. %	Sizes between ½" and ⅛" Total wt. lbs	Ash. %	Sizes under ⅛" Total wt lbs	Ash. %
19.	Original coal						
20.	Washed coal.						
21.	Refuse—coarse						
22.	Hutch product	This lignite was not washed					
23.	Jig slimes						
24.	Table slimes						

TABLE D.

Results of Washing (Totals).

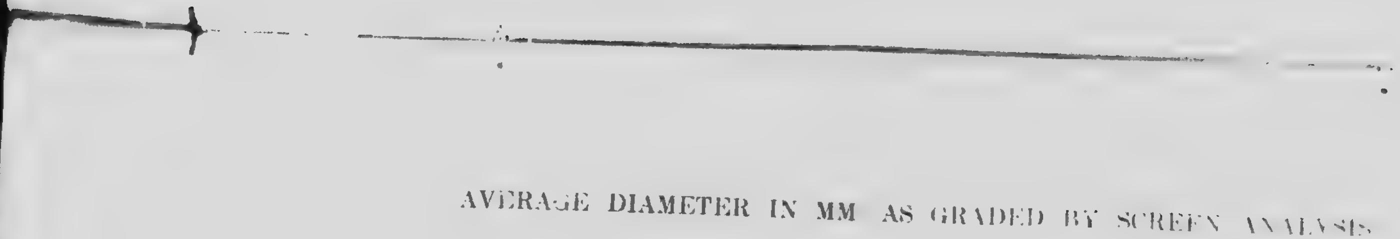
		wt. in lbs.	% ash	% sulphur
25.	Original coal			
26.	Washed coal	" "	" "	" "
27.	Refuse	" "	" "	" "
28.	Other products	" "	" "	" "
29.	Loss	" "	" "	" "
30.	Loss in	" "	" "	" "

TABLE E.

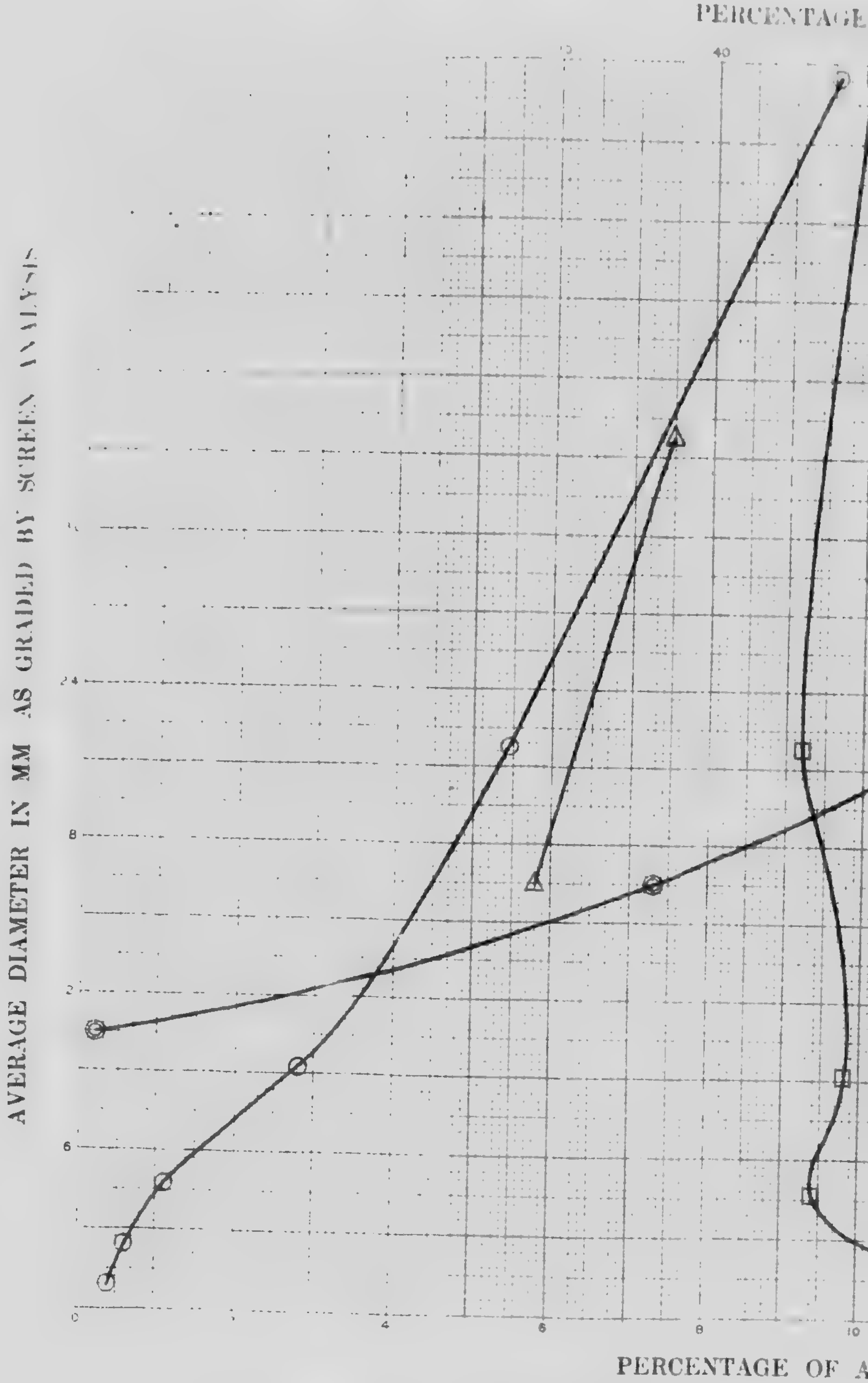
Summary Statement of Effect of Washing on Fuel Values.

31. Recovery of washed coal, including good bone.. % ... Ratio to standard
32. Reduction in ash.............................. % .... " "
33. " " sulphur................................ % .... " "
34. Increase in calorific value—calorimeter .... %
35. Increase in evaporation under boiler .... %
36. Decrease in clinker under boiler %
37. Fuel ratio of original coal.
38. " " washed " ....
39. Calorific value of original coal.. ...
40. " " washed "

Remarks on Tables C, D, and E.—None of the lignites were washed.


AVERAGE DIAMETER IN MM AS GRADED BY SCREEN ANALYSIS

RAPHIC RECORD OF SIZ

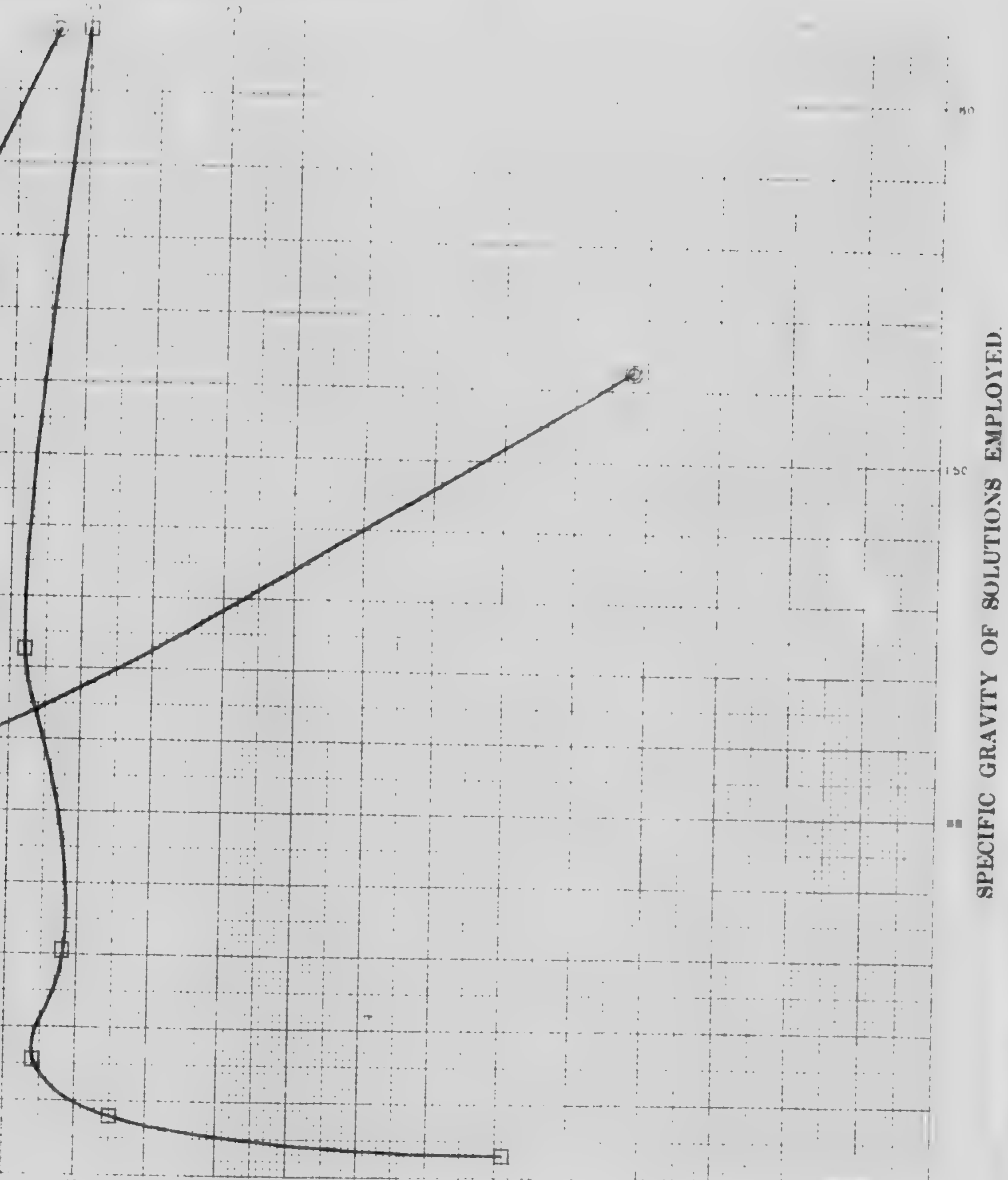


LEGEND: SYMBOLS.

Curve showing the relative quantities of the several sizes.
" " " " " " " densities.
○ " " " percentage of ash in each of the several sizes.
" " " " material floating at the sever

F SIZING AND SPECIFIC

NTAGE OF SIZE AND OF FLOAT



E OF ASH IN SIZE AND IN FLOAT.

COAL No. 46
Appendix I, Vol. III

es.
sizes.
the several densities.

COAL.—No. 42.

Locality.—Edmonton, Alberta.

Colliery.—Parkdale Coal Co., Edmonton.

Sample.—A sample of twenty-five sacks was taken directly from the car screen at the bank head, on July 15, 1908, and an additional sample of seventy-five sacks was taken at the same place on August 1. The coal is drawn from three entries driven to the southeast, northeast, and northwest from the bottom of the shaft, which is 196 feet deep.

TABLE A

Specific Gravity Tests.

	Specific gravity of solution.	Float %	Ash in Float %	Sink %	Ash in Sink %
1.	1·530	95·3	10·0	4·7	53·2
2.	1·430	84·1	9·6	15·9	26·3
3.	1·375	0·0	....	100·0	12·0
4.	1·325	0·0	....	100·0	11·9

The following results are obtained from the above data, and the chemists results :—

5.	Good coal, Sp. Gr. under 1·375	% yield	..	% ash	...
6.	Bone coal, Sp. Gr. 1·375 to 1·55	" "	96·0	" "	10·2
7	Useful coal—sum of (5) and (6)	" "	96·0	" "	10·2
8.	Refuse, Sp. Gr. over 1·55	" "	4·0	" "	55·0
9.	Assay of original sample raw coal as sent to chemist			" "	10·9
10.	" " " " " "			% sulphur	0·4
11.	" " " " " "			Fuel Ratio	1·36
12.	Assay of mixed good and bone coal (5) and (6)			" "	1·36

Remarks.—This coal is a typical western lignite and is quite unsuitable for washing. It consists of fairly homogeneous high ash coal, with a small amount of refuse matter itself very low in ash.

Scree[illegible]

	Maximum Screen MM.	Minimum Screen MM.	[illegible]	% of whole sample	% Ash in size
13.	6·34	3·16	4·75	56·0	9·0
14.	3·16	1·20	2·18	26·3	8·4
15.	1·20	0·64	0·92	10·1	8·7
16.	0·64	0·30	47	4·3	8·7
17.	0·30	0·173	4	2·3	10·6
18.	0·173	0·000	46	1·0	11·4

Remarks.—The coal is not at all friable when fresh and makes very little dust. What refuse there is in it is weak[illegible] the coal

TABLE C.

Results of Washing (Details of Sizes).

	Original coal and its products.	Sizes between 1" and ½" Total wt. lbs.	Ash. %	Sizes between ½" and ⅛" Total wt. lbs.	Ash. %	Sizes under ⅛" Total wt. lbs.	Ash %
19.	**Original coal**						
20.	Washed coal						
21.	Refuse—coarse						
22.	Hutch product	This lignite was not washed.					
23.	Jig slimes						
24.	Table slimes						

TABLE D.

Results of Washing (Totals).

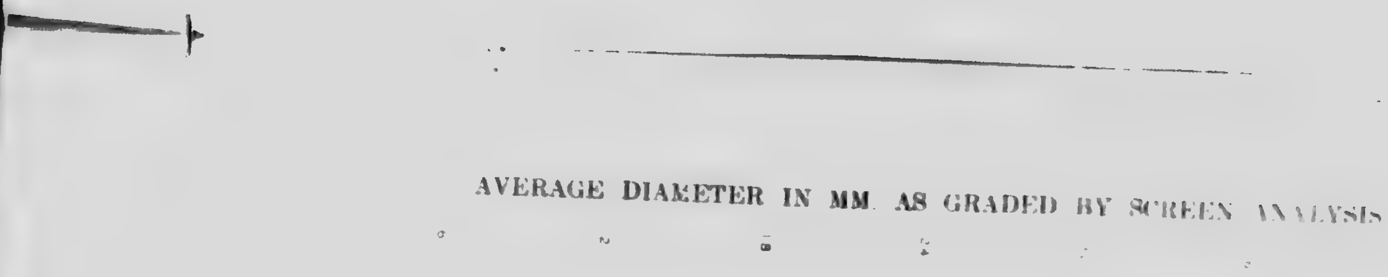
25.	Original coal	wt. in lbs.	% ash	% sulphur
26.	Washed coal	" "	" "	" "
27.	Refuse	" "	" "	" "
28.	Other products	" "	" "	" "
29.	Loss	" "	" "	" "
30.	Loss in %			

TABLE E.

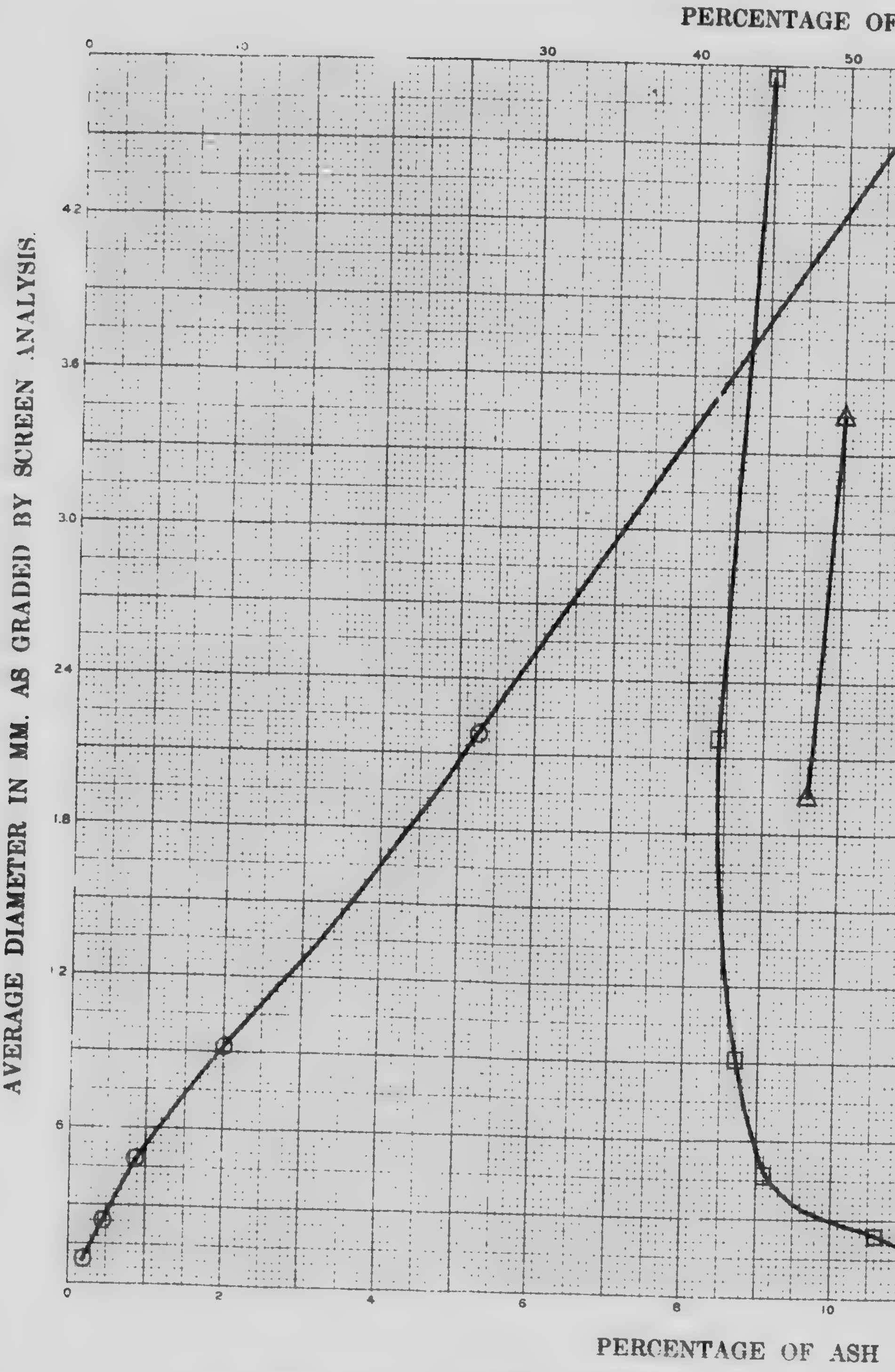
Summary Statement of Effect of Washing on Fuel Values.

31. Recovery of washed coal, including good bone.. %
32. Reduction in ash .... % ... Ratio to standard
33. " " sulphur........ % ... " "
34. Increase in calorific value—calorimeter .. % " "
35. Increase in evaporation under boiler ... %
36. Decrease in clinker under boiler........ %
37. Fuel ratio of original coal.
38. " " washed "
39. Calorific value of original coal.
40. " " washed "

Remarks on Tables C, D, and E.—None of the lignites were washed.


AVERAGE DIAMETER IN MM. AS GRADED BY SCREEN ANALYSIS

GRAPHIC RECORD OF SIZIN

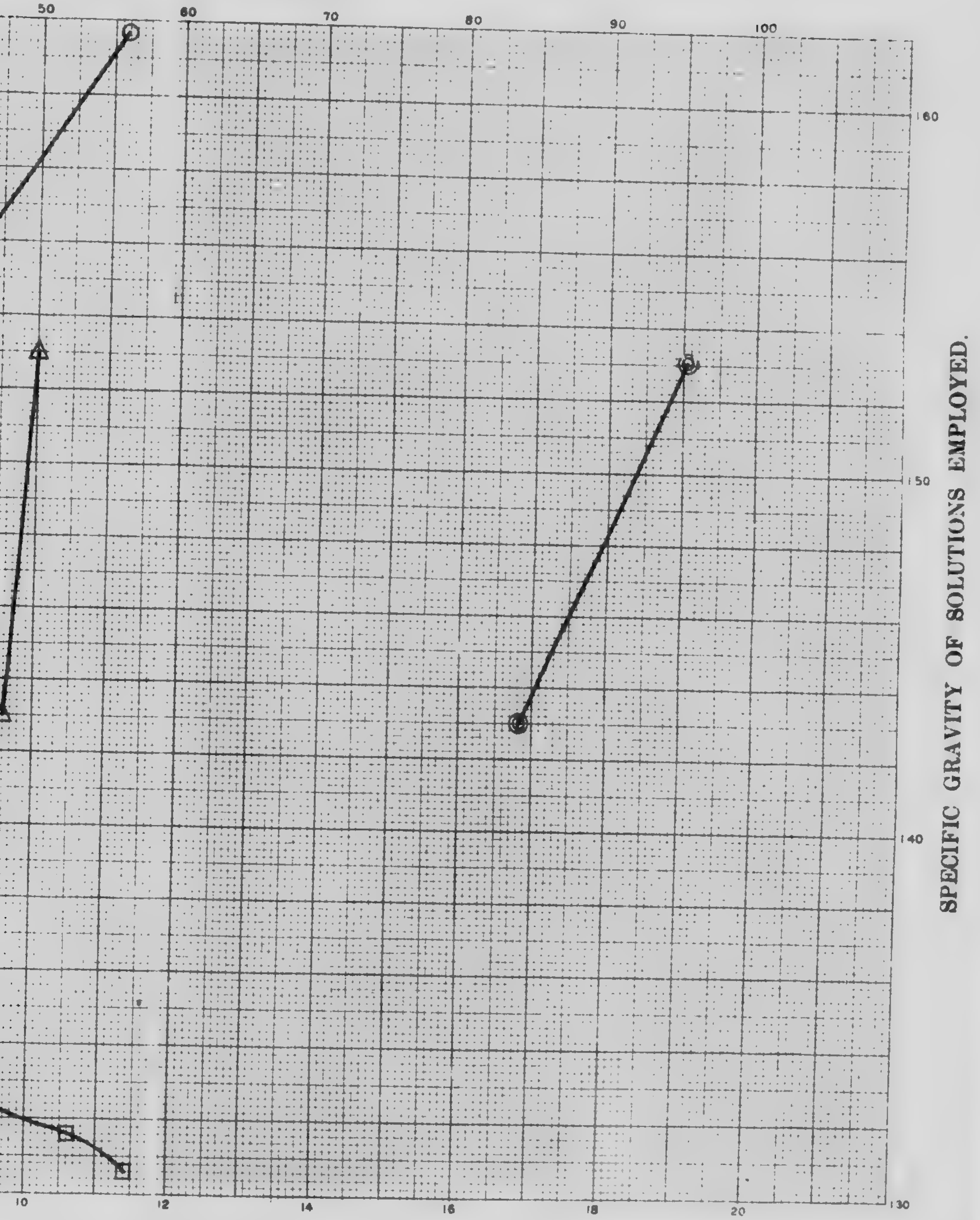


LEGEND: SYMBOLS.

○ Curve showing the relative quantities of the several sizes.
△ " " " " " " " " densities.
□ " " " percentage of ash in each of the several sizes.
● " " " " " " " material floating at the several de

SIZING AND SPECIFIC GRAVITY TESTS.

AGE OF SIZE AND OF FLOAT.



F ASH IN SIZE AND IN FLOAT.

COAL No. 42
APPENDIX I, VOL. III

several densities.

COAL.—No. 45.

Locality.—Edmonton, Alberta.

Colliery.—Standard Coal Co., formerly City Coal Co.

Sample.—A sample of twenty-five sacks was taken from a pile which had been mined a few hours before. The coal, which had all been screened over bars with 1½″ openings, had been drawn from workings from one to 300 yards northwest of the shaft. Sampled July 16, 1908.

TABLE A.

Specific Gravity Tests.

	Specific gravity of solution.	Float %	Ash in Float %	Sink %	Ash in Sink %
1.	1·550	97·0	8·0	3·0	41·3
2.	1·440	52·7	7·0	47·3	12·0
3.	1·390	6·0	5·2	94·0	9·1
4.	1·300	0·0	....	100·0	9·0

The following results are obtained from the above data, and the chemists results :—

5.	Good coal, Sp. Gr. under 1·375	% yield	....	% ash	...
6.	Bone coal, Sp. Gr. 1·375 to 1·55	" "	97·0	" "	8·0
7.	Useful coal—sum of (5) and (6)	" "	97·0	" "	8·0
8.	Refuse, Sp. Gr. over 1·55	" "	3·0	" "	41·3
9.	Assay of original sample raw coal as sent to chemist			" "	8·1
10.	" " " " " "			% sulphur	0·4
11.	" " " " " "			Fuel Ratio	1·19
12.	Assay of mixed good and bone coal (5) and (6)			" "	1·30

Remarks.—This coal, like the other Alberta lignites, is not suitable for washing. Nearly all of the ash is innate, and the refuse is exceptionally small in amount.

TABLE B.

Screen Analysis.

	Maximum Screen MM.	Minimum Screen MM.	Mean MM.	% of whole sample	% Ash in size
13.	6·34	3·16	4·75	47·6	6·7
14.	3·16	1·20	2·18	26·0	6·7
15.	1·20	0·64	0·92	12·8	7·8
16.	0·64	0·30	0·47	6·9	7·1
17.	0·30	0·173	0·24	4·3	7·5
18.	0·173	0·000	0·086	2·4	9·5

Remarks.—This coal is similar to No. 42, but somewhat weaker. The ash-bearing material, while small in amount, is weaker than the coal itself, and produces more dust.

TABLE C.

Results of Washing (Details of Sizes).

	Original coal and its products.	Sizes between 1" and ½" Total wt. lbs.	Ash. %	Sizes between ½" and ⅛" Total wt. lbs.	Ash. %	Sizes under ⅛" Total wt. lbs.	Ash. %
19.	Original coal	This lignite was not washed					
20.	Washed coal						
21.	Refuse—coarse						
22.	Hutch product						
23.	Jig slimes						
24.	Table slimes						

TABLE D.

Results of Washing (Totals).

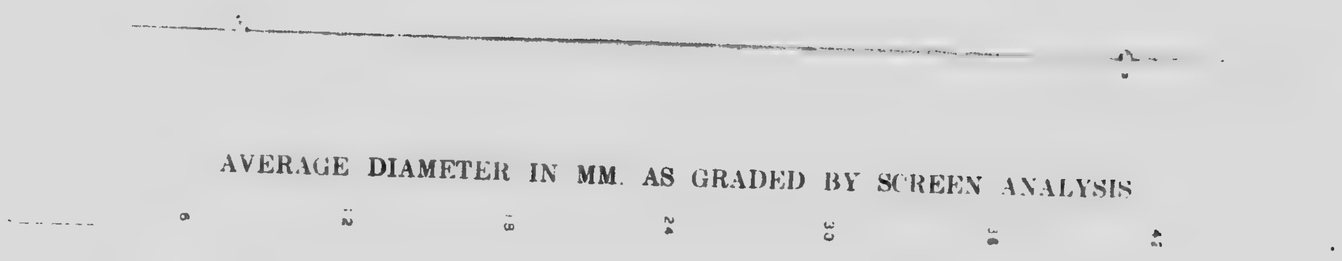
25.	Original coal	wt. in lbs.	% ash	% sulphur ....
26.	Washed coal	" "	" "	" " ....
27.	Refuse	" "	" "	" " ....
28.	Other products	" "	" "	" " ....
29.	Loss	" "	" "	" " ....
30.	Loss in %	....	....	....

TABLE E

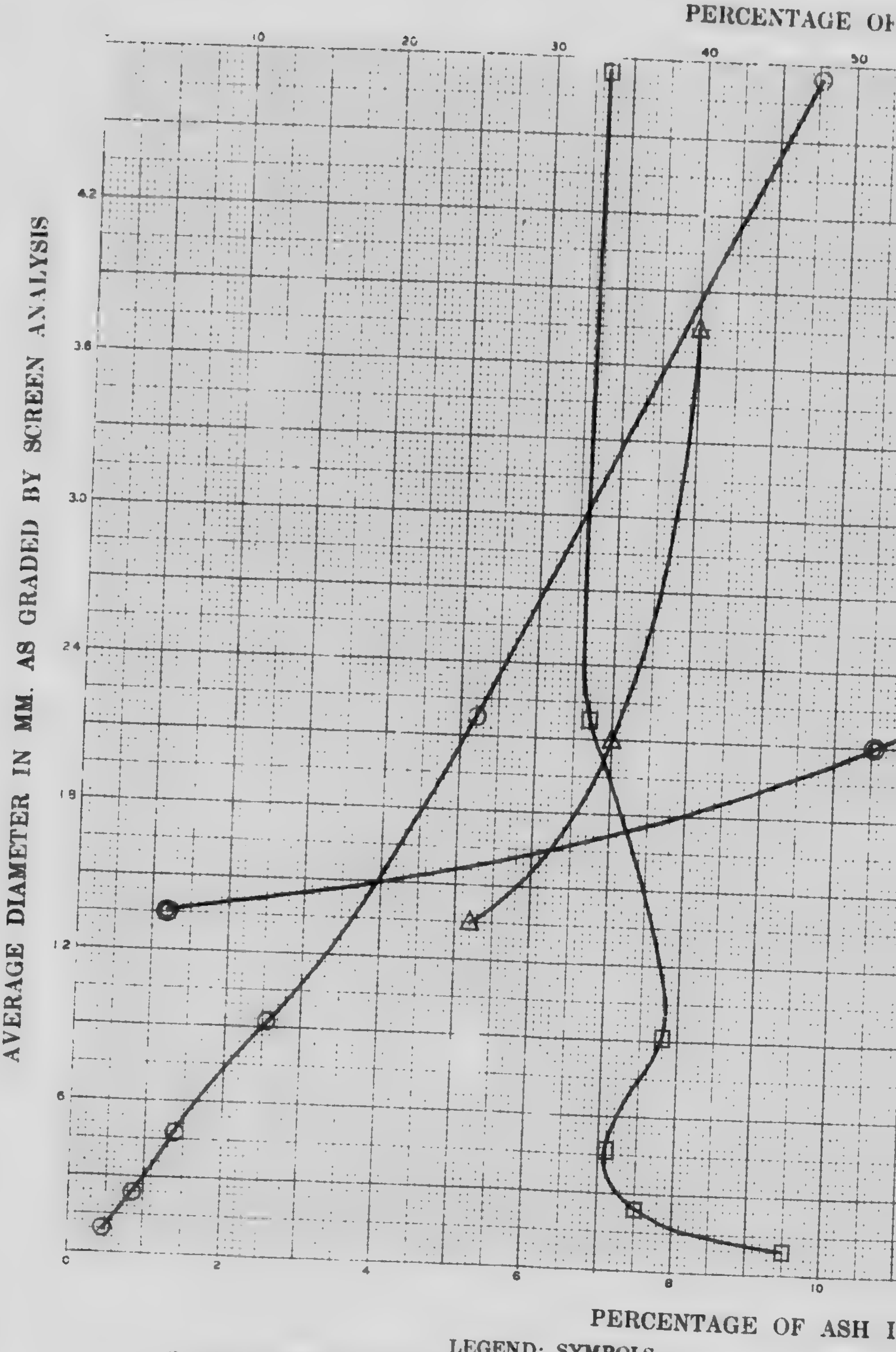
Summary Statement of Effect of Washing on Fuel Values.

31. Recovery of washed coal, including good bone.... % .... Ratio to standard . . .
32. Reduction in ash.............................. % .... " " ....
33. " " sulphur.......................... % .... " " ....
34. Increase in calorific value—calorimeter.......... %
35. Increase in evaporation under boiler............ %
36. Decrease in clinker under boiler................ %
37. Fuel ratio of original coal.... ....
38. " " washed " ....
39. Calorific value of original coal.. ....
40. " " washed " ....

Remarks on Tables C, D, and E.—None of the lignites were washed.


AVERAGE DIAMETER IN MM. AS GRADED BY SCREEN ANALYSIS
6
12
18
24
30
36
42

GRAPHIC RECORD OF SIZIN

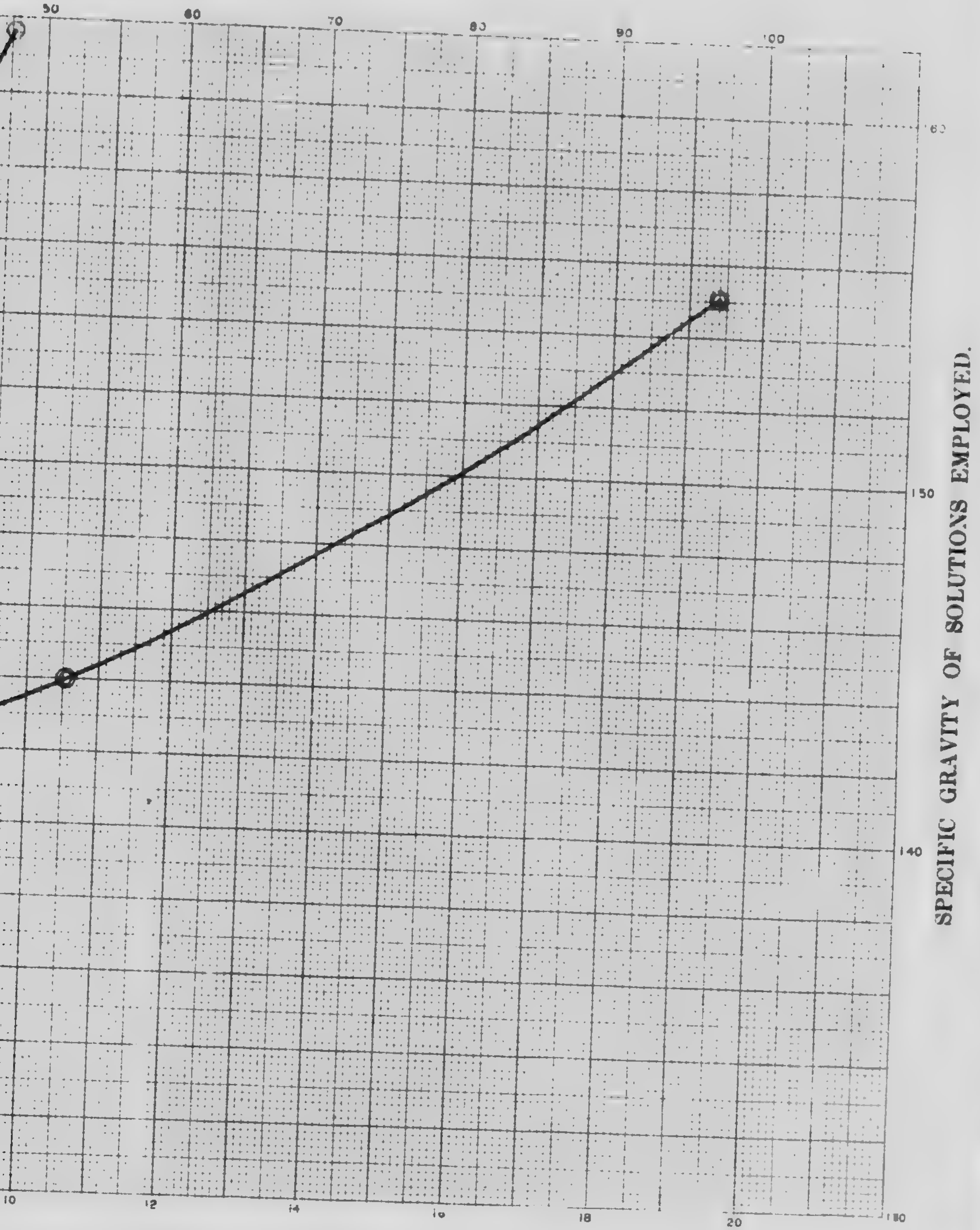


LEGEND: SYMBOLS.

○ Curve showing the relative quantities of the several sizes.
△ " " " " " ' " " densities.
□ " " " percentage of ash in each of the several sizes.
○ " " " " " " material floating at the several den

SIZING AND SPECIFIC GRAVITY TESTS.

AGE OF SIZE AND OF FLOAT.



ASH IN SIZE AND IN FLOAT.

COAL No. 45
Appendix I, Vol. III

veral densities.

BELLY RIVER FIELD, LETHBRIDGE, ALBERTA.

ERRATUM

On the curve diagrams accompanying the tabulated records of each of the coals tested, is the following legend:—

LEGEND: SYMBOLS

○ Curve showing the relative quantities of the several sizes
△ " " " " " " " " densities
□ " " " percentage of ash in each of the several sizes
◉ " " " " " " " material floating at the several densities.

The above legend is incorrect; in each case it should read thus:—

○ Curve showing the relative quantities of the several sizes
□ " " " percentage of ash in each of the several sizes.
◉ " " " " " material floating at the several densities.
△ " " " " " ash in " " " " "

COAL.—No. 43.

Locality.—Taber, Alberta.

Colliery.—Canada West Coal Co.

Sample.—A sample of seventy-five sacks, representi[illegible] the average coal from Levels No. 2 East and No. 2 West, at distances of [illegible]bout 800 feet in on the main entry and 1,200 feet out on the levels. The coa[illegible] was screened on a ¾" shaking screen before sacking. Sampled July 23, 19[illegible]

TABLE A.

Specific Gravity Tests.

	Specific gravity of solution.	Float %	Ash in Float %	[illegible]nk %	[illegible] in Sink
1.	1·530	90·0	11·4	[illegible]·0	
2.	1·425	59·0	7·9	[illegible]·0	
3.	1·375	34·0	5·4	[illegible]·0	
	1·315	5·0	[illegible]	[illegible]0	

The following results are obtained fro[illegible] [illegible] data, and the chemists results

5. Good coal, Sp. Gr. under 1·375 . . . . yield 34 [illegible] ash [illegible]
6. Bone coal, Sp. Gr. 1·375 to 1·55 . . . . " " [illegible] " "
7. Useful coal—sum of (5) and (6) . . . . " " [illegible] " "
8. Refuse, Sp. Gr. over 1·55 . . . . " " [illegible] " " 11 [illegible]
9. Assay of original sample raw coal as sent to chemist [illegible] 45 0
10. " " " " " " [illegible] 14 1
11. " " " " " " [illegible]hur 1·4
12. Assay of mixed good and bone coal (5) and (6) [illegible] Ratio 1·39
1·41

Remarks.—This coal is lignitic in charact[illegible] and [illegible] be properly judged by standards which are suitable for [illegible] little distinction between good coal and bone c[illegible] [illegible] fact, the latter is, in this case, and that of the Ga[illegible] [illegible] fuel. The coal would not be sufficiently improved by [illegible]ashing [illegible] treatment.

TABLE B.

Screen Analysis.

	Maximum Screen MM.	Minimum Screen MM.	Mean MM.	% of [illegible] sample	% Ash in
13.	6·34	3·16	4·75	34·9	12·9
14	3·16	1·20	2·18	36·8	12·3
15.	1·20	0·64	0·92	14·3	[illegible]·7
16.	0·64	0·30	0·47	7·7	[illegible]·9
17.	0·30	0·173	0·24	4·[illegible]	12·8
18.	0·173	0·000	0·086	1·9	14·5

Remarks.—The coal is apparently not so strong as that from Lethbridge No. 44, but yet it is by no means weak or friable. The ash-forming materials do not seem to differ greatly from the coal in strength.

TABLE C.

Results of Washing (Details of Sizes).

	Original coal and its products.	Sizes between 1" and ½" Total wt. lbs.	Ash. %	Sizes between ½" and ⅛" Total wt. lbs.	Ash. %	Sizes under ⅛" Total wt. lbs.	Ash. %
19	Original coal						
20.	Washed coal						
21	Refuse—coarse..	This coal was not washed					
22.	Hutch product .						
23.	Jig slimes ...						
24.	Table slimes .						

TABLE D.

Results of Washing (Totals).

25.	Original coal	wt. in lbs.	% ash	% sulphur ....
26.	Washed coal....	" "	" "	" " ....
27.	Refuse	" "	" "	" " ....
28.	Other products....................	" "	" "	" " ....
29.	Loss	" "	" "	" " ....
30.	Loss in %	" "	" "	" " ....

TABLE E.

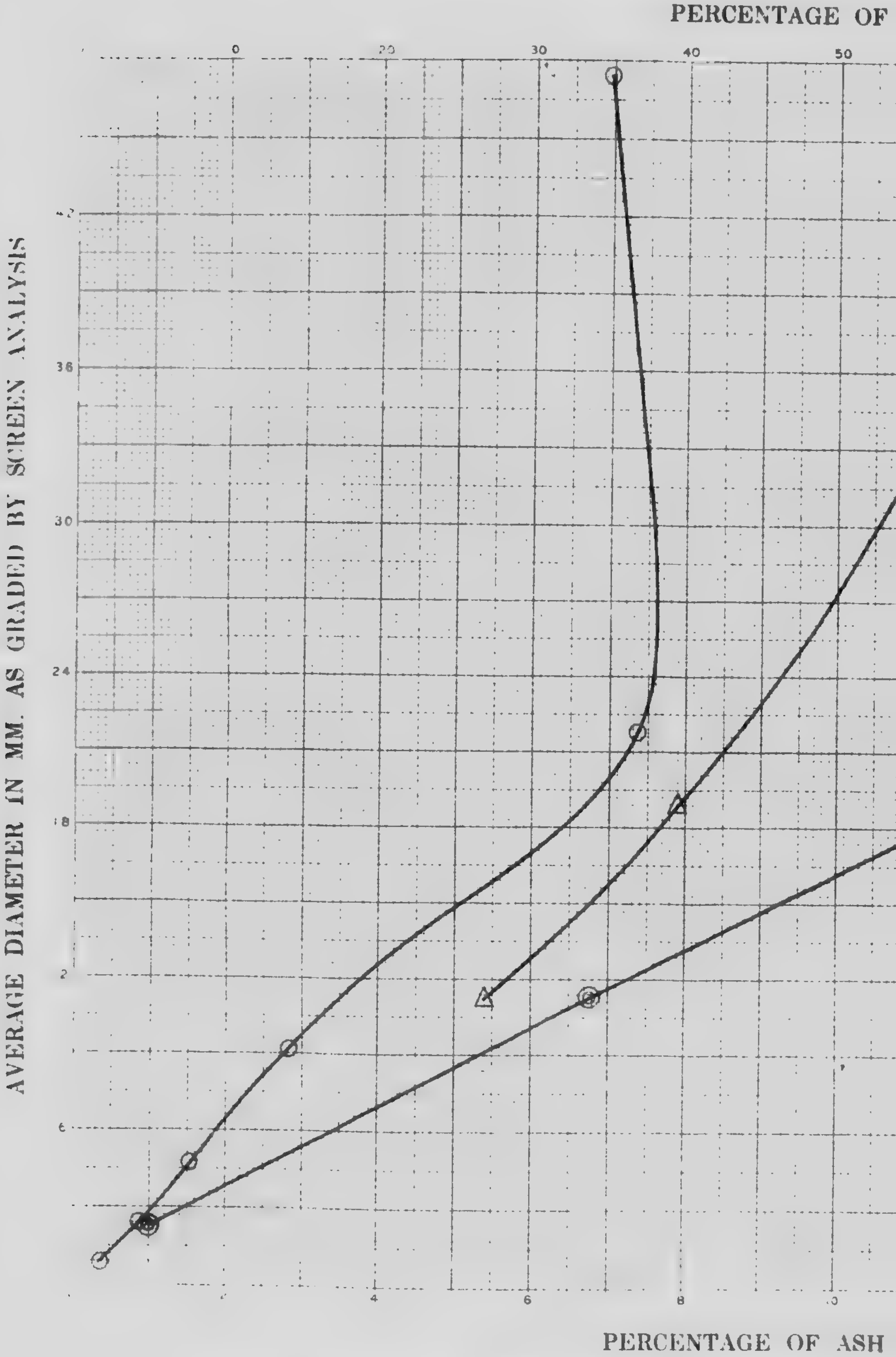
Summary Statement of Effect of Washing on Fuel Values.

31. Recovery of washed coal, including good bone. . %
32. Reduction in ash .... % .... Ratio to standard
33. " " sulphur. .... % .... " "
34. Increase in calorific value—calorimeter .... % .... " " ...
35. Increase in evaporation under boiler.... .... % ...
36. Decrease in clinker under boiler.... .... % ..
37. Fuel ratio of original coal.. ...
38. " " washed " ...
39. Calorific value of original coal
40. " " washed "

Remarks on Tables C, D, and E.—For reasons already explained this coal was not washed.

AVERAGE DIAMETER IN MM. AS GRADED BY SCREEN ANALYSIS

GRAPHIC RECORD OF SIZING



LEGEND: SYMBOLS.

Curve showing the relative quantities of the several sizes.

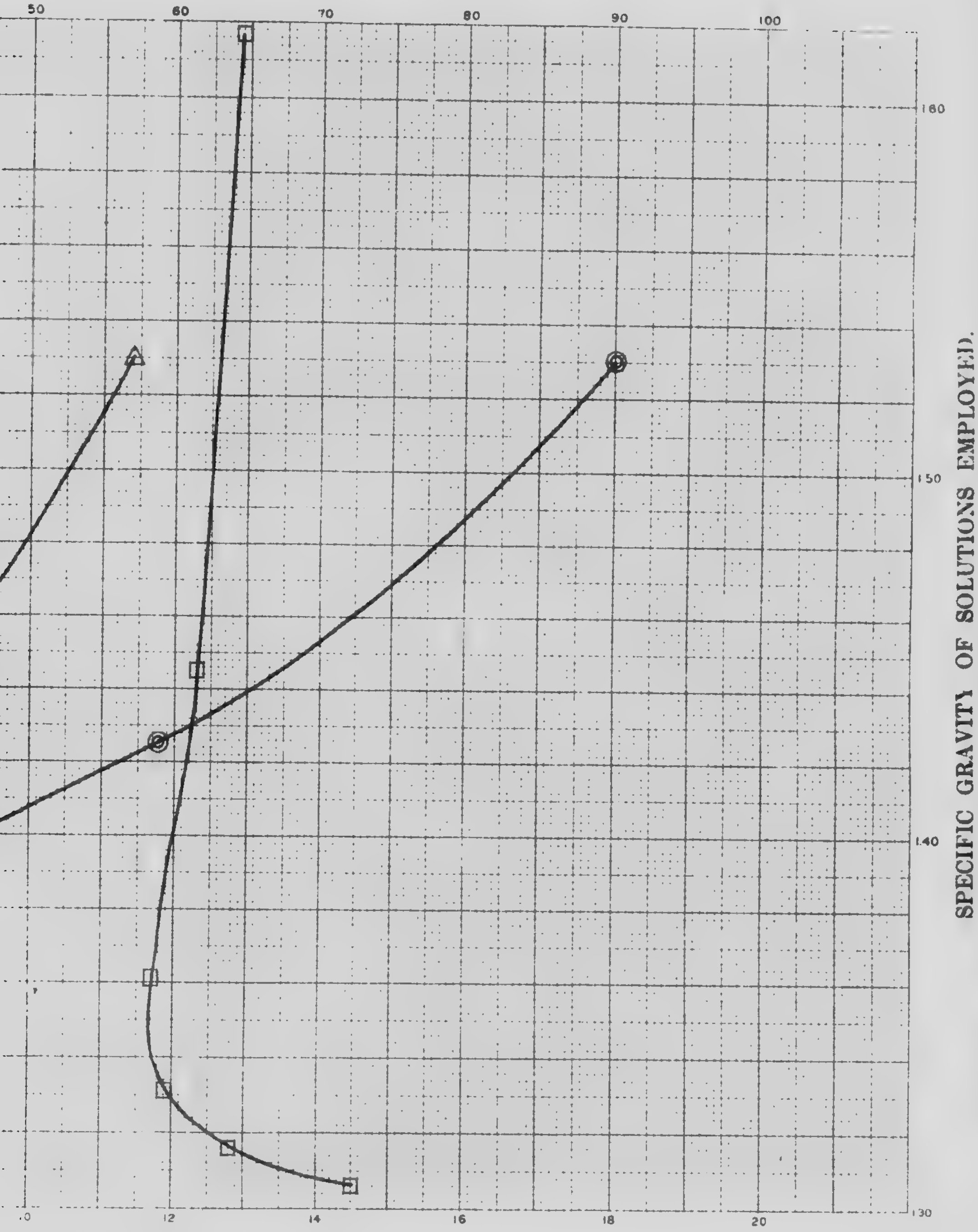
" " " " " " " densities.

" " " percentage of ash in each of the several sizes.

○ " " " " " " " material floating at the several d

ZING AND SPECIFIC GRAVITY TESTS.

GE OF SIZE AND OF FLOAT.



F ASH IN SIZE AND IN FLOAT.

COAL No. 43
APPENDIX I, VOL. III

3.
several densities.

COAL.—No. 44.

Locality.—Lethbridge, Alberta.

Colliery.—Galt colliery, Alberta Railway and Irrigation Co.

Sample.—Eight sacks were filled from each of five railway cars, and ten sacks from one car. The cars had just been loaded with coal which had been screened over $\frac{3}{4}''$, and had been hand picked. The sample represents the ordinary screened coal shipped by the Company. Sampled July 22, 1908.

TABLE A.

Specific Gravity Tests.

	Specific gravity of solution.	Float %	Ash in Float %	Sink %	Ash in Sink %
1.	1·540	94·9	8·3	5·1	49·0
2.	1·440	89·3	7·3	10·7	35·3
3.	1·380	84·5	6·9	15·5	29·0
4.	1·330	31·8	4·7	68·2	12·9

The following results are obtained from the above data, and from the chemists results.

5.	Good coal, Sp. Gr. under 1·375	% yield	83·5	% ash	6·8
6.	Bone coal, Sp. Gr. 1·375 to 1·55	“ “	12·2	“ “	20·0
7.	Useful coal—sum of (5) and (6)	“ “	95·5	“ “	8·4
8.	Refuse, Sp. Gr. over 1·55	“ “	4·5	“ “	52·0
9.	Assay of original sample raw coal as sent to chemist			“ “	11·0
10.	“ “ “ “ “ “			% sulphur	0·8
11.	“ “ “ “ “ “			Fuel Ratio	1·37
12.	Assay of mixed good and bone coal (5) and (6)			“ “	1·36

Remarks.—The coal contains a large amount of innate ash, and a moderate amount of bone coal high in ash, but quite suitable for burning. There is little refuse, and it is low in ash. The coal would, therefore, be very little improved by washing.

TABLE B.

Screen Analysis.

	Maximum Screen MM.	Minimum Screen MM.	Mean MM.	% of whole sample	% Ash in size
13.	6·34	3·16	4·75	47·5	11·3
14.	3·16	1·20	2·18	31·1	9·9
15.	1·20	0·64	0·92	11·9	9·8
16.	0·64	0·30	0·47	5·0	10·7
17.	0·30	0·173	0·24	2·9	12·4
18.	0·173	0·000	0·086	1·6	16·8

Remarks.—The coal is not at all friable, and stands shipment and crushing well, making very little dust. The coarse and fine sizes contain more ash than the intermediate, indicating that probably there are two ash-bearing materials, one weaker and the other stronger than the coal itself.

TABLE C.

Results of Washing (Details of Sizes).

	Original coal and its products.	Sizes between 1" and ½" Total wt. lbs.	Ash. %	Sizes between ½" and ⅛" Total wt. lbs.	Ash. %	Sizes under ⅛" Total wt. lbs.	Ash. %
19.	Original coal ...	This coal was not washed.					
20.	Washed coal....						
21.	Refuse—coarse..						
22.	Hutch product..						
23.	Jig slimes.....						
24.	Table slimes...						

TABLE D.

Results of Washing (Totals).

25. Original coal .... wt. in lbs. ... % ash .... % sulphur
26. Washed coal........................ " " ... " " ... " "
27. Refuse........................ " " ... " " ... " "
28. Other products .... " " ... " " ... " "
29. Loss .... " " ... " " ... " "
30. Loss in % .... " " ... " " ... " "

TABLE E.

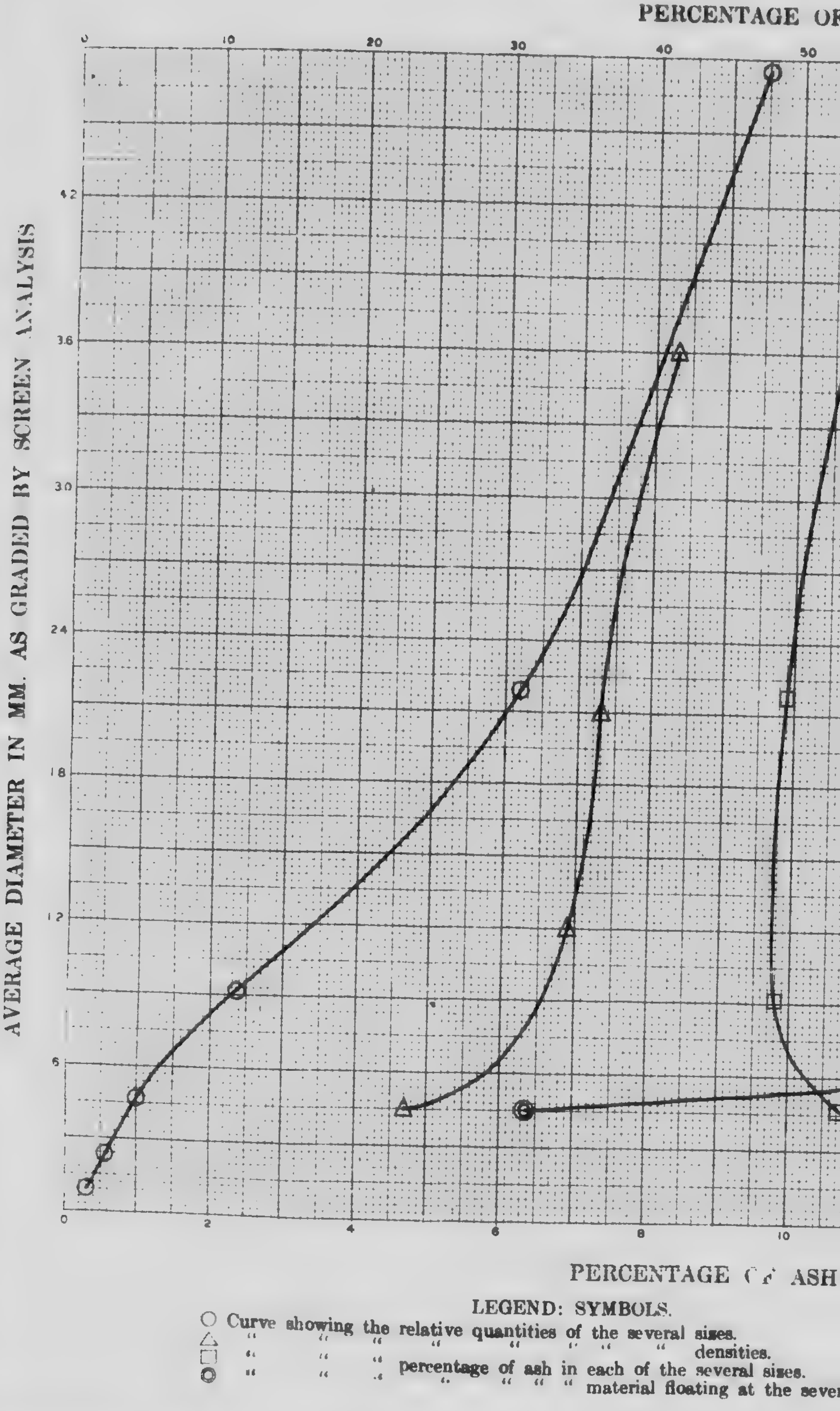
Summary Statement of Effect of Washing on Fuel Values.

31. Recovery of washed coal, including good bone %
32. Reduction in ash .... % Ratio to standard
33. " " sulphur........ % " "
34. Increase in calorific value—calorimeter % " "
35. Increase in evaporation under boiler %
36. Decrease in clinker under boiler %
37. Fuel ratio of original coal. %
38. " " washed " ...
39. Calorific value of original coal
40. " " washed "

Remarks on Tables C, D, and E.—This coal was not washed, for reasons already stated.

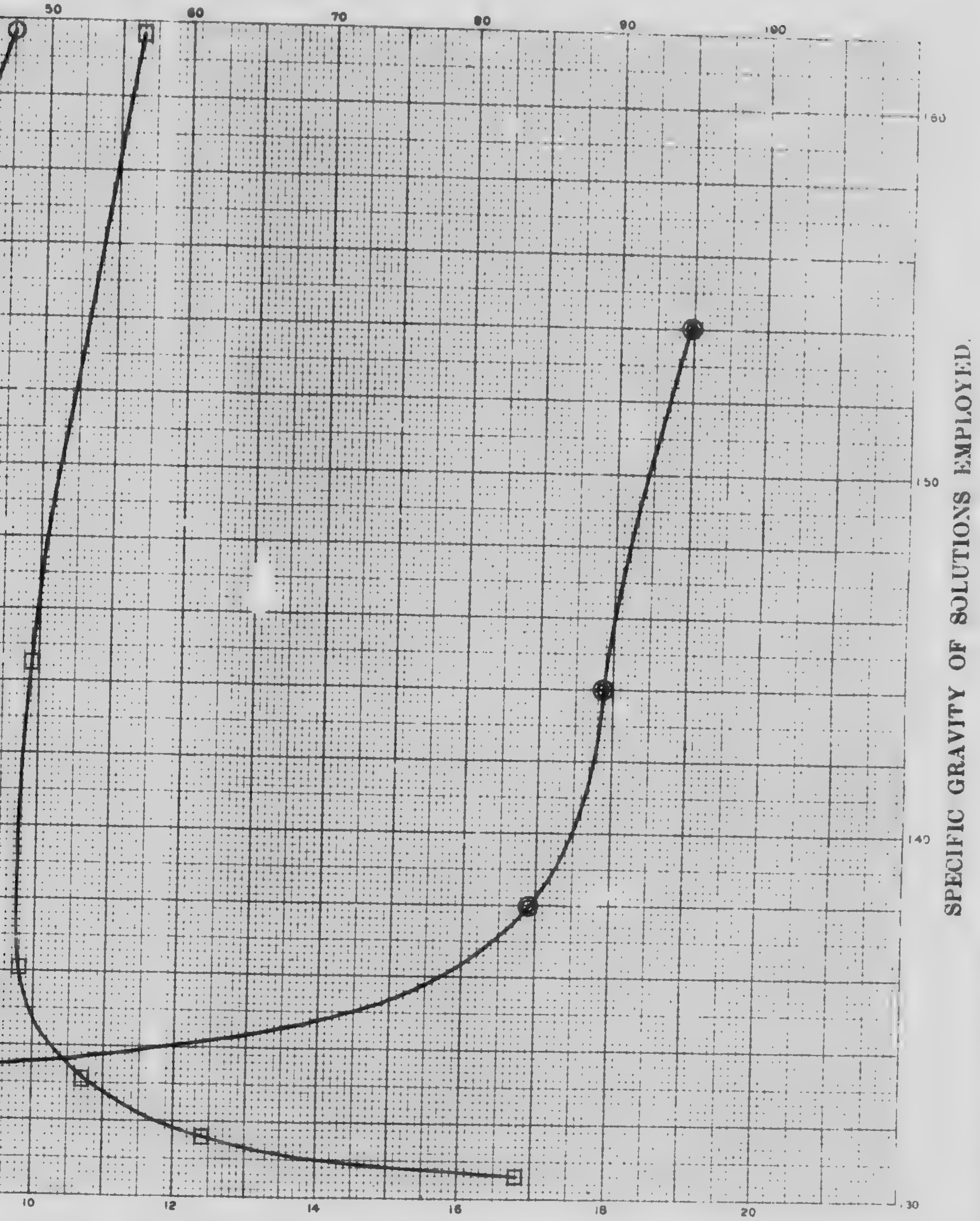
AVERAGE DIAMETER IN MM. AS GRADED BY SCREEN ANALYSIS.
0
.6
1.2
1.8
2.4
3.0
3.6
4.2

GRAPHIC RECORD OF SIZING



SIZING AND SPECIFIC GRAVITY TESTS.

AGE OF SIZE AND OF FLOAT.



F ASH IN SIZE AND IN FLOAT.

COAL No. 44
APPENDIX I, VOL. III

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the several densities.

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COAL.—No. 47.

Locality.—**Lundbreck, Alberta.**

Colliery.—**Lun-Breckenridge.**

Sample.—Twenty-two sacks were taken from a chute which had been left partly filled with coal in February, 1908. The mine was not in operation at the time of taking the sample, July 21, 1908, and, in fact, had not been operated for nearly six months. The sample was run of mine, and probably represents a much poorer grade of coal than would be produced under commercial conditions.

TABLE A.

Specific Gravity Tests.

	Specific gravity of solution.	Floa. %	Ash in Float %	Sink %	Ash in Sink %
1.	1·540	73·8	12·7	26·2	68·5
2.	1·415	49·4	8·6	50·6	51·7
3.	1·370	44·6	7·7	55·4	42·1
4.	1·350	12·7	3·9	87·3	31·3

The following results are obtained from the above data, and from the chemists results :—

5.	Good coal, Sp. Gr. under 1·375	% yield	45·5	% ash	7·8
6.	Bone coal, Sp. Gr. 1·375 to 1·55	" "	31·0	" "	20·5
7.	Useful coal—sum of (5) and (6)	" "	76·5	" "	13·0
8.	Refuse, Sp. Gr. over 1·55	" "	23·5	" "	71·0
9.	Assay of original sample raw coal as sent to chemist			" "	29·7
10.	" " " " " "			% sulphur	1·2
11.	" " " " " "			Fuel Ratio	1·33
12.	Assay of mixed good and bone coal (5) and (6)			" "	1·50

Remarks.—This coal is very high in innate ash. It also contains a large amount of bone coal, rather high in ash, and a considerable amount of refuse, very high in ash. The coal could be greatly improved by washing. It would, however, still carry about 15 per cent of ash unless the amount of bone discarded were very large.

TABLE B.

Screen Analysis.

	Maximum Screen MM.	Minimum Screen MM.	Mean MM.	% of whole sample	% Ash in size
13.	6·34	3·16	4·75	33·1	33·8
14.	3·16	1·20	2·18	30·6	30·7
15.	1·20	0·64	0·92	13·2	28·3
16.	0·64	0·30	0·47	7·2	26·8
17.	0 30	0·173	0·24	6·2	26·1
18.	0·173	0·000	0 086	10·7	31·5

Remarks.—The sample was run of mine, and is, apparently, mod [illegible]ly [illegible]able. Possibly the considerable percentage of fine coal may be in part due to the age of the sample, which had remained in the chutes for nearly six months before it was drawn.

TABLE C.

Results of Washing (Details of Sizes).

	Original coal and its products.	Sizes between 1" and ½" Total wt. lbs.	Ash. %	Sizes between ½" and ⅛" Total wt. lbs.	Ash. %	Sizes under ⅛" Total wt. lbs.	Ash. %
19.	Original coal						
20.	Washed coal						
21.	Refuse—coarse	This sample was not washed.					
22.	Hutch product						
23.	Jig slimes						
24.	Table slimes						

TABLE D

Results of Washing (Totals).

25. Original coal ....wt. in lbs. .... % ash .... % sulphur ....
26. Washed coal.............................. " " .... " " .... " " ....
27. Refuse.. " " .... " " .... " " ....
28. Other products............................ " " .... " " .... " " ....
29. Loss.. " " .... " " .... " " ....
30. Loss in %

TABLE E.

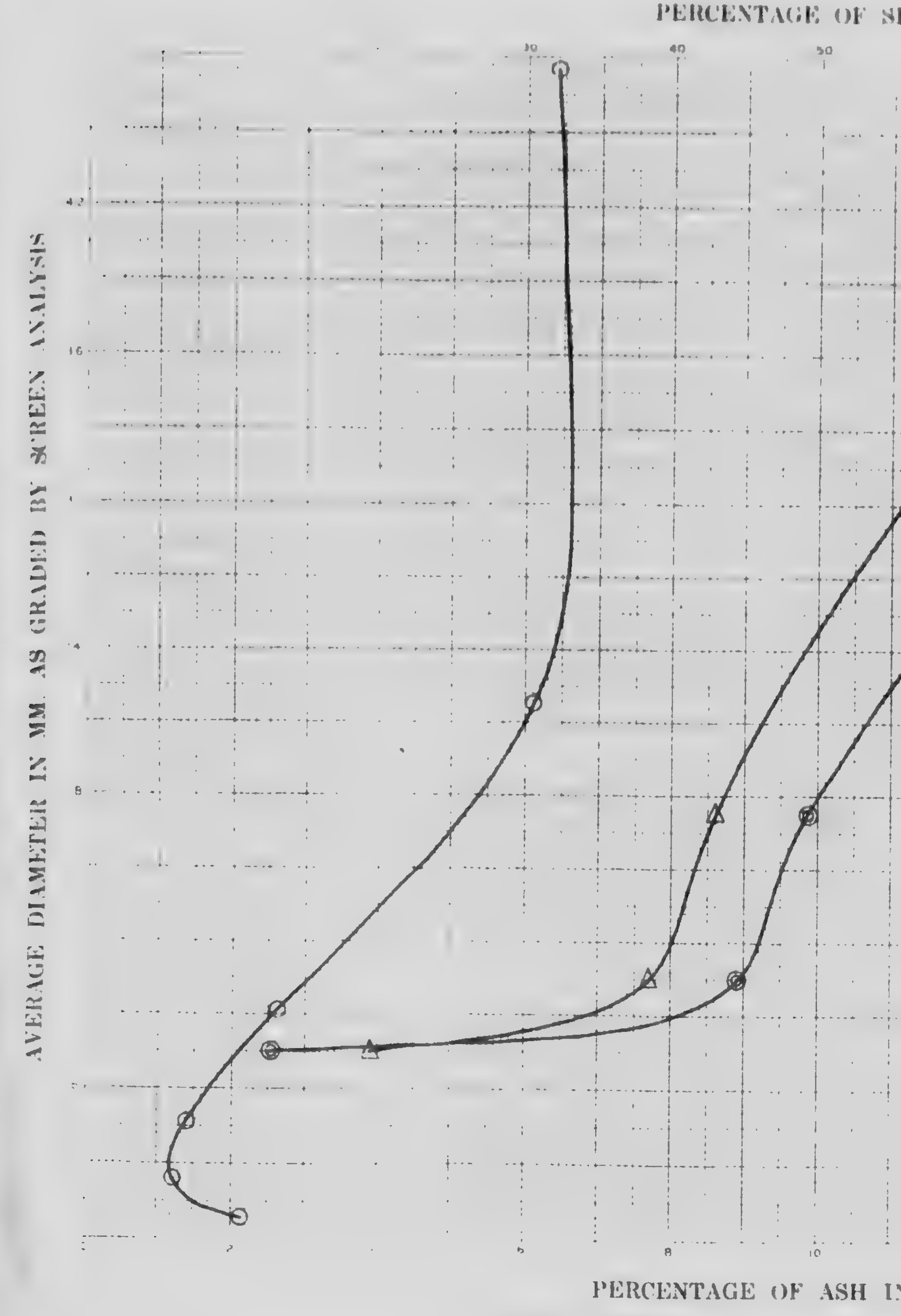
Summary Statement of Effect of Washing on Fuel Values.

31. Recovery of washed coal, including good bone....% .... Ratio to standard ....
32. Reduction in ash....................................% .... " " ....
33. " " sulphur...% .... " " ....
34. Increase in calorific value—calorimeter ....%
35. Increase in evaporation under boiler.............%
36. Decrease in clinker under boiler....................%
37. Fuel ratio of original coal.
38. " " washed "
39. Calorific value of original coal.
40. " " washed "

Remarks on Tables C, D, and E.—This coal was not washed, owing to the small size of the sample, and the doubt as to whether it was really representative of what the property would offer in full operation. If the sample may be taken as representative, it would be possible to greatly improve the coal by washing, but a high grade product could not be produced in commercial treatment.

AVERAGE DIAMETER IN MM. AS GRADED BY SCREEN ANALYSIS.

GRAPHIC RECORD OF SIZING A

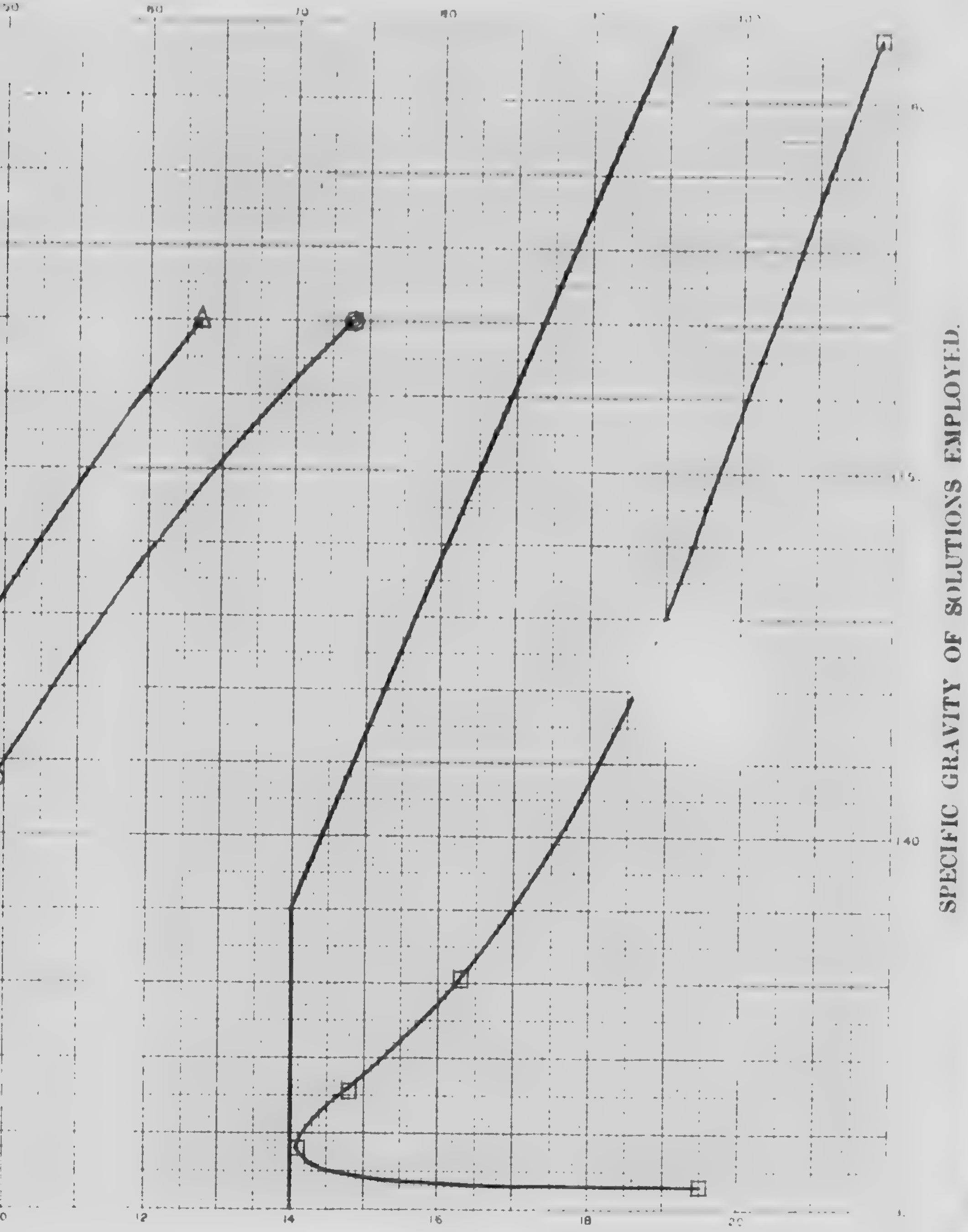


LEGEND: SYMBOLS.

Curve showing the relative quantities of the several sizes.
△ " " " " " " " " densities.
" " " percentage of ash in each of the several sizes.
○ " " " " " " " material floating at the several d

ING AND SPECIFIC GRAVITY TESTS.

OF SIZE AND OF FLOAT



ASH IN SIZE AND IN FLOAT.

COAL No. 17
APPENDIX I VOL. III

s.
several densities.

THE EASTERN CROWSNEST PASS
OR FRANK-BLAIRMORE FIELD.

ERRATUM

On the curve diagrams accompanying the tabulated records of each of the coals tested, is the following legend:—

LEGEND: SYMBOLS

○ Curve showing the relative quantities of the several sizes
" " " " " " " " densities
" " " percentage of ash in each of the several sizes
⊙ " " " " " " material floating at the several densities

The above legend is incorrect; in each case it should read thus:—

○ Curve showing the relative quantities of the several sizes.
□ " " " percentage of ash in each of the several sizes
⊙ " " " " " material floating at the several densities.
△ " " " " " ash in " " " " "

COAL.—No. 48.

Locality.—Passburg, Alberta.

Company.—Leitch Collieries, Ltd., Leitch colliery.

Sample.—This sample of sixty-two sacks was from a new mine, just being opened, on the 7 ft. seam, the entry being in only 1400 feet and the coal coming from workings about 50 feet to the rise. The sample was run of mine, taken directly from the cars. Sampled July 18, 1908.

TABLE A.

Specific Gravity Tests.

	Specific gravity of solution.	Float %	Ash in Float %	Sink %	Ash in Sink %
1.	1·530	75·1	8·2	24·9	45·0
2.	1·410	59·0	6·9	41·0	33·6
3.	1·380	55·6	5·6	44·4	32·0
4.	1·340	31·1	4·2	68·9	24·0

The following results are obtained from the above data, and from the chemists results :—

5.	Good coal, Sp. Gr. under 1·375	% yield	54·6	% ash	5·5
6.	Bone coal, Sp. Gr. 1·375 to 1·55	" "	24·4	" "	15·5
7.	Useful coal—sum of (5) and (6)	" "	79·0	" "	8·4
8.	Refuse, Sp. Gr. over 1·55	" "	21·0	" "	47·0
9.	Assay of original sample raw coal as sent to chemist			" "	17·9
10.	" " " " " "			% sulphur	0·6
11.	" " " " " "			Fuel Ratio	2·04
12.	Assay of mixed good and bone coal (5) and (6)			" "	2·18

Remarks.—The innate ash is high, and the amount of bone and refuse large, with fairly low ash. This coal is supposed to be from the same seam as No. 33, but it is somewhat better suited to washing, although with the high innate ash, and the low refuse ash, no very satisfactory results are possible.

TABLE B.

Screen Analysis.

	Maximum Screen MM.	Minimum Screen MM.	Mean MM.	% of whole sample	% Ash in size
13.	6·34	3·16	4·75	28·1	18·6
14.	3·16	1·20	2·18	22·3	19·3
15.	1·20	0·64	0·92	17·4	18·8
16.	0·64	0·30	0·47	10·5	16·3
17.	0·30	0·173	0·24	9·8	15·3
18.	0·173	0·000	0·086	11·8	15·8

Remarks.—This coal is very similar to the other samples taken from the neighbourhood, and scarcely needs further comment.

TABLE C.

Results of Washing (Details of Sizes).

	Original coal and its products.	Sizes between 1" and ½" Total wt. lbs.	Ash. %	Sizes between ½" and ¼" Total wt. lbs.	Ash. %	Sizes under ¼" Total wt. lbs.	Ash. %
19.	Original coal . . .	. . . .	. . . .	. . . .	. . . .	. . . .	. . .
20.	Washed coal. . . .	. . . .	. . .	. . . .	. . . .	. . .	. . .
21.	Refuse—coarse. .	.		.	. .	.	
22.	Hutch product. .	. . . .	. . .	. .	. . .		
23.	Jig slimes.	. . . .	. . .	. . . .	. . . .	. . . .	. .
24.	Table slimes. . . .	. . . .	. . .	. . .	. . . .	. . .	. . .

TABLE D.

Results of Washing (Totals).

25. Original coal . . . . wt. in lbs. . . . . % ash . . . . % sulphur . .
26. Washed coal. . . . . " " . . . . " " . . . . " " . .
27. Refuse. . . . . " " . . . . " " . . . . " " . .
28. Other products. " " . . . . " " . . . . " " . .
29. Loss. . . . . " " . . . . " " . . . . " " . .
30. Loss in %

TABLE E.

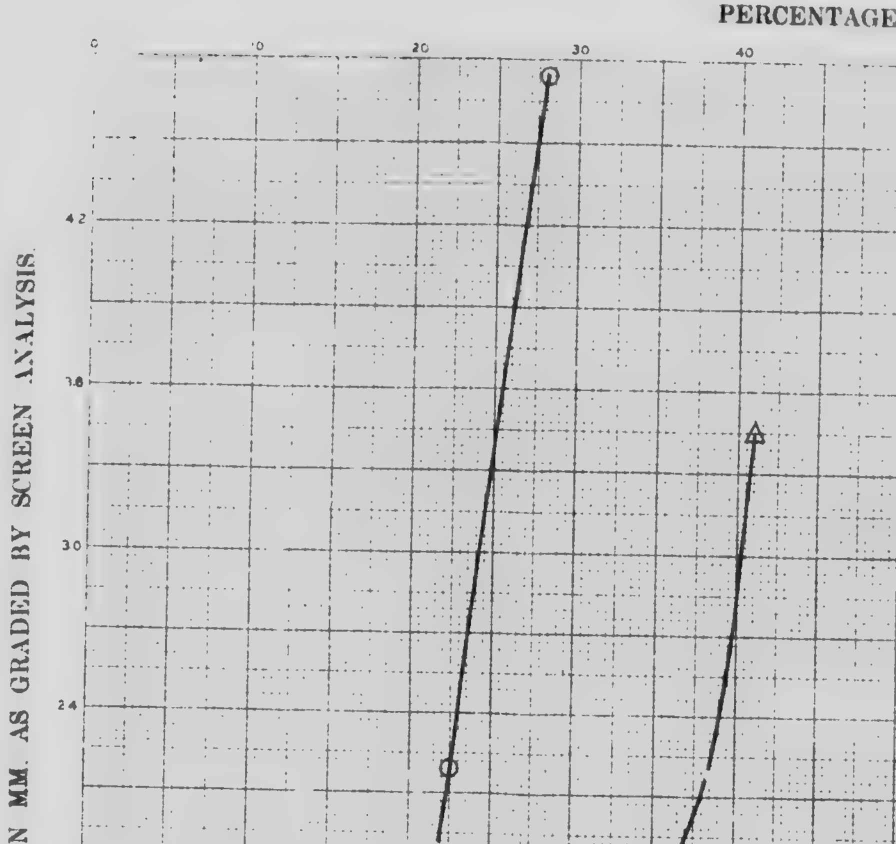
Summary Statement of Effect of Washing on Fuel Values.

31. Recovery of washed coal, including good bone. . . . % . . . . Ratio to standard .
32. Reduction in ash. . . . . % . . . . " " . . . .
33. " " sulphur. . . . . % . . . . " " . . . .
34. Increase in calorific value—calorimeter . . . . % . . . .
35. Increase in evaporation under boiler. . . . . %
36. Decrease in clinker under boiler. . . . . %
37. Fuel ratio of original coal. . . . .
38. " " washed " . . . .
39. Calorific value of original coal. . . . .
40. " " washed " . . . .

Remarks on Tables C, D, and E.—This coal was not washed, as the specific gravity trials did not promise very satisfactory results.

AVERAGE DIAMETER IN MM. AS GRADED BY SCREEN ANALYSIS

GRAPHIC RECORD OF SIZ



LEGEND: SYMBOLS.

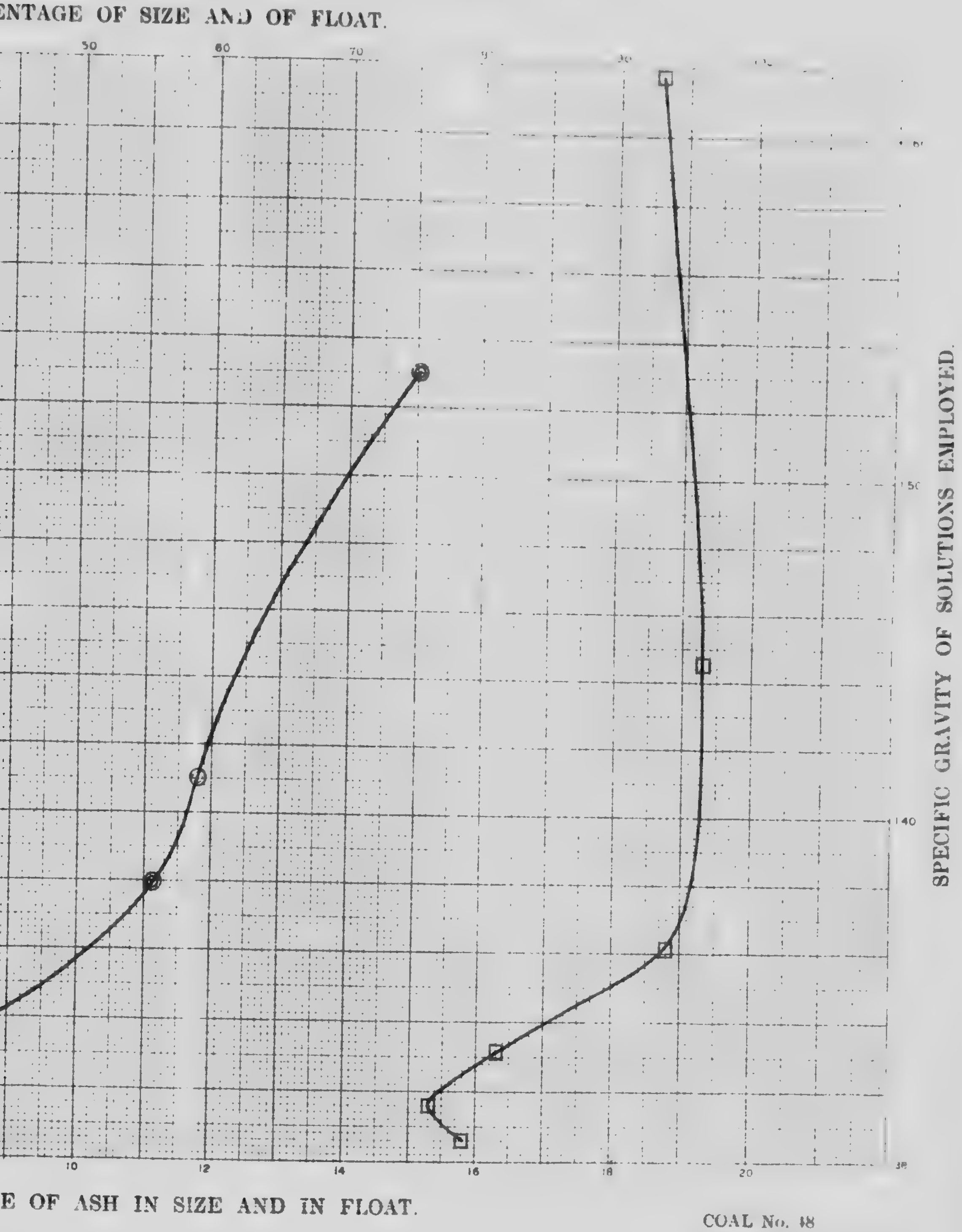
○ Curve showing the relative quantities of the several sizes.

△ " " " " " " " " densities.

■ " " " percentage of ash in each of the several sizes.

" " " " material floating at the sever

F SIZING AND SPECIFIC GRAVITY TESTS.



COAL No. 48
APPENDIX I, VOL. III

sizes.
the several densities.

COAL No. 32

Locality.—Hillcrest, near Frank, Alberta.

Colliery.—Hillcrest Coal and Coke Co., Hillcrest colliery.

Sample.—One hundred and forty-five sacks from the main workings of the mine, which are on the rise south of a tunnel extending about 3000 feet into the mountain. The sample was run of mine, taken directly from the bunkers. Sampled May 4, 1908.

TABLE A

Specific Gravity Tests.

	Specific gravity of solution.	Float %	Ash in Float %	Sink %	Ash in Sink %
1	1·550	84·5	7·3	15·5	56·3
2.	1·470	80·9	7·0	19·1	49·6
3.	1·365	57·2	3·7	42·8	30·5
4.	1·325	23·9	1·7	76·1	19·4

The following results are obtained from the above data, and from the chemists results :—

5. Good coal, Sp. Gr. under 1·375 .... % yield 60·5 % ash 4·1
6. Bone coal, Sp. Gr. 1·375 to 1·55 .... " " 24·0 " " 15·6
7. Useful coal—sum of (5) and (6) .... " " 84·5 " " 7·3
8. Refuse, Sp. Gr. over 1·55 .... " " 15·5 " " 56·3
9. Assay of original sample raw coal as sent to chemist .... " " 15·3
10. " " " " " " .... % sulphur 0·6
11. " " " " " " .... Fuel Ratio 1·89
12. Assay of mixed good and bone coal (5) and (6) .... " " 2·00

Remarks.—The coal contains a moderate proportion of innate ash, and carries a large amount of bone, rather low in ash, and a large amount of refuse, fairly high in ash. The coal could be considerably improved by washing, but is somewhat difficult to treat in a thoroughly satisfactory way, owing to the large amount of low ash bone.

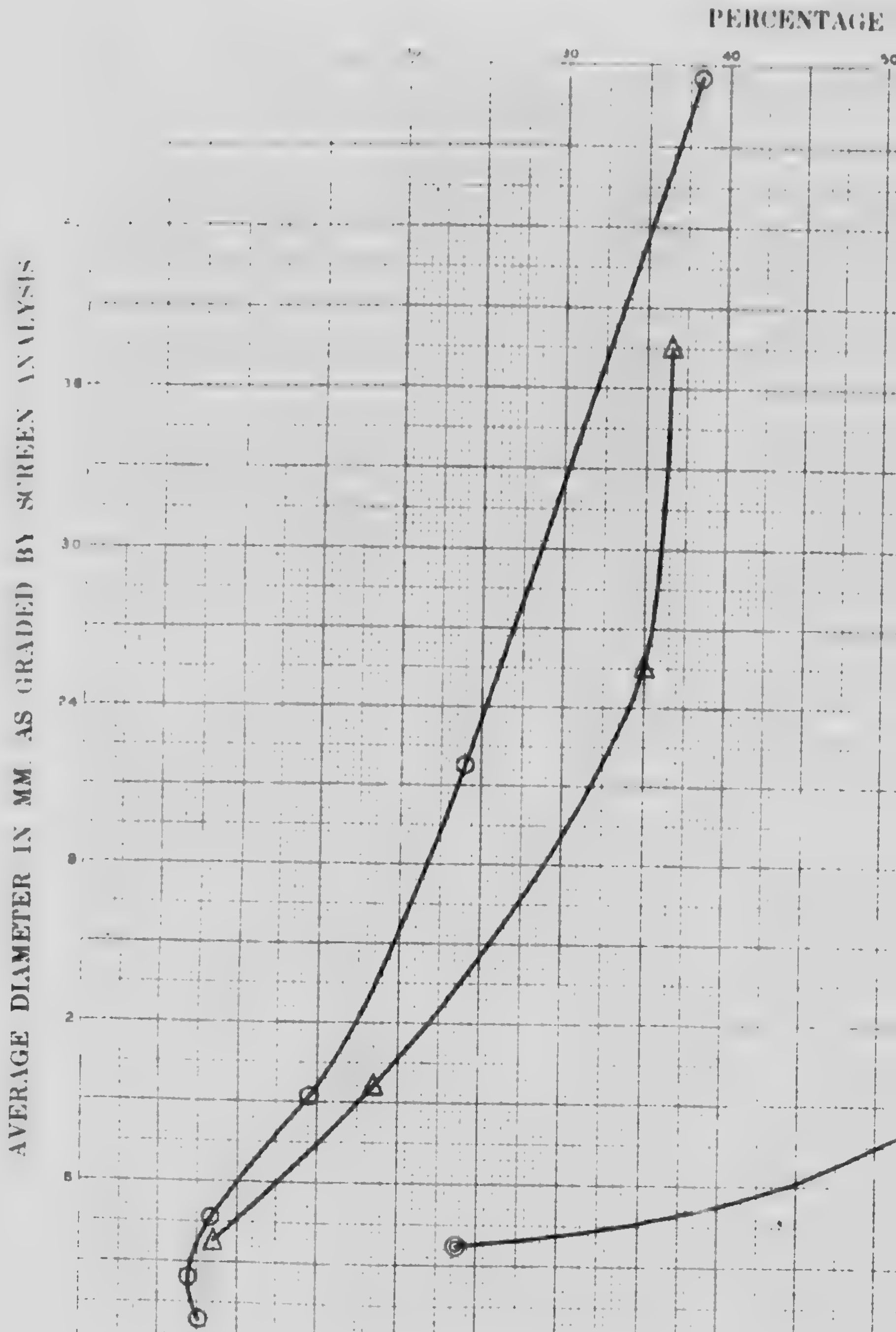
TABLE B

Screen Analysis.

	Maximum Screen MM.	Minimum Screen MM.	Mean MM.	% of whole sample	% Ash in size
13.	6·34	3·16	4·75	38·4	15·3
14.	3·16	1·20	2·18	24·0	16·4
15.	1·20	0·64	0·92	14·6	14·2
16.	0·64	0·30	0·47	8·4	13·3
17.	0·30	0·173	0·24	7·0	13·4
18.	0·173	0·000	0·086	7·6	14·8

Remarks.—The amount of ash in the several sizes is unusually constant, although such variations as there are seem to be erratic. In view of the fact that the coal is run of mine, the proportion of fine sizes is not great, proving the coal to be only moderately friable.

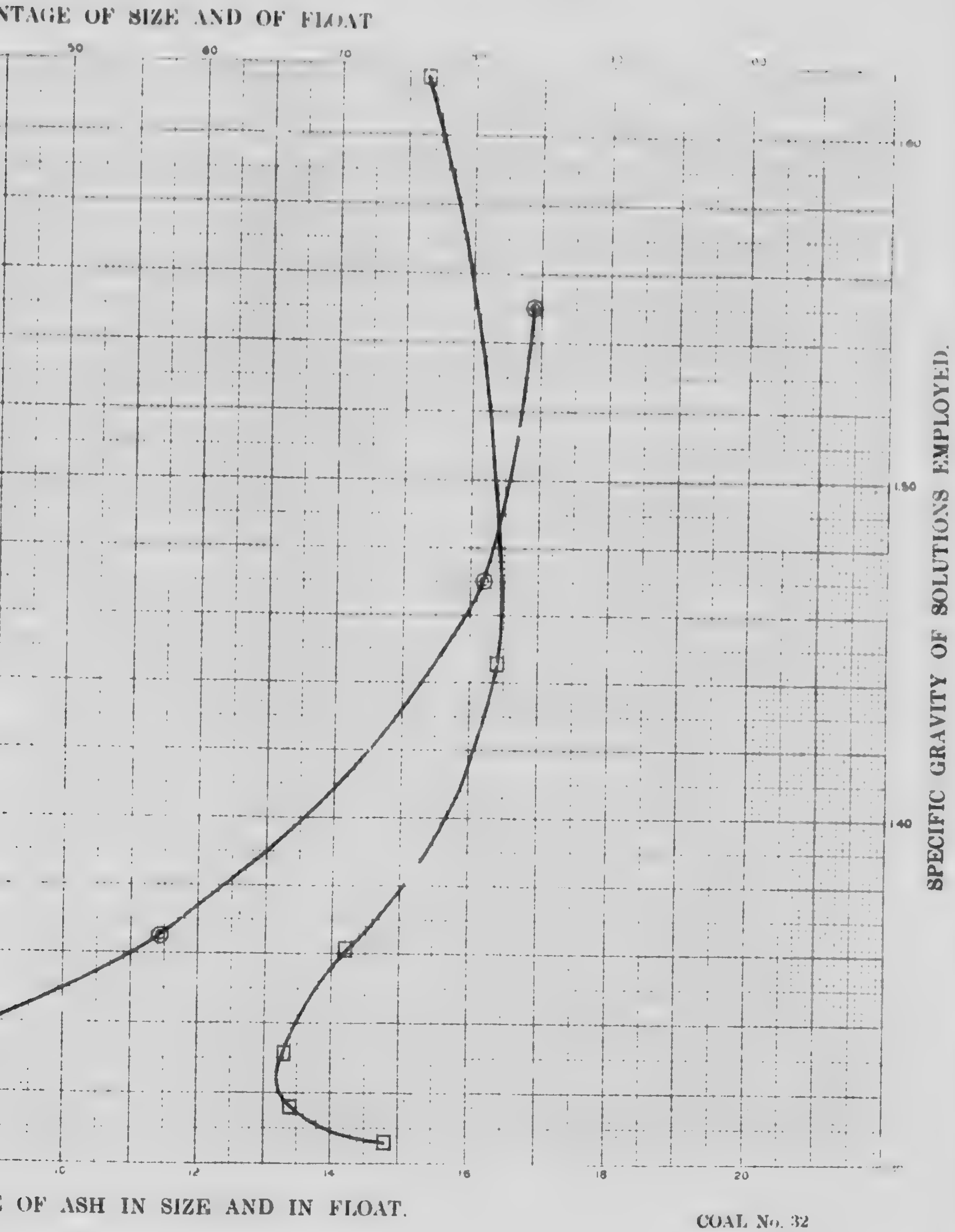
GRAPHIC RECORD OF SIZ



LEGEND: SYMBOLS.

Curve showing the relative quantities of the several sizes.
" " " " " " " densities.
" " " percentage of ash in each of the several sizes.
" " " " material floating at the sever

SIZING AND SPECIFIC GRAVITY TESTS



COAL No. 32
APPENDIX I, VOL. III

s.
sizes.
the several densities.

COAL No. 53

Locality.—Frank, Alta.

Colliery.—West Canadian collieries, Bellevue mine.

Sample.—One hundred and thirty-seven sacks from No. 1 seam. The sample was taken from the cars as they came direct from the mine workings, about 5000 feet in on the main entry, and 200 feet above it. The sample was run of mine, without screening or handpicking, beyond the occasional removal of conspicuous pieces of rock during the loading. Sampled May 5, 1908.

TABLE A.

Specific Gravity Tests.

	Specific gravity of solution.	Float %	Ash in Float %	Sink %	Ash in Sink %
1.	1·540	86·9	9·2	13·2	43·5
2.	1·440	73·0	7·2	27·0	32·8
3.	1·365	47·0	5·1	53·0	22·4
4.	1·315	21·0	2·8	79·0	18·2

The following results are obtained from the above data, and from the chemists' results :—

5. Good coal, Sp. Gr. under 1·375 . . . . . . % yield 51·7 % ash 5·4
6. Bone coal, Sp. Gr. 1·375 to 1·55 . . . . . " " 35·8 " " 15·0
7. Useful coal—sum of (5) and (6) . . . . " " 87·5 " " 9·5
8. Refuse, Sp. Gr. over 1·55 . . . . . " " 12·5 " " 45·0
9. Assay of original sample raw coal as sent to chemist . . . " " 15·5
10. " " " " " " . . . % sulphur 0·8
11. " " " " " " . . . Fuel Ratio 2·06
12. Assay of mixed good and bone coal (5, 6) . . . " 2·69

Remarks.—The innate ash is high ; both the bone coal and the refuse are high in amount, but rather low in ash. The coal is, therefore, not very suitable for washing, although it can, of course, be considerably improved.

TABLE B.

Screen Analysis.

	Maximum Screen MM.	Minimum Screen MM.	Mean MM.	% of whole sample	% Ash in size
13.	6·34	3·18	4·75	35·1	19·3
14.	3·18	1·20	2·18	19·3	16·4
15.	1·20	0·64	0·92	13·5	13·8
16.	0·64	0·30	0·47	9·7	13·5
17.	0·30	0·173	0·24	9·8	13·0
18.	0·173	0·000	0·086	12·6	14·3

Remarks.—The coal is moderately friable, the pure material being weaker than the bone and slate.

TABLE C

Results of Washing (Details of Sizes).

	Original coal and its products.	Sizes between 1" and ½" Total wt. lbs.	Ash. %	Sizes between ½" and ⅛" Total wt. lbs.	Ash. %	Sizes under ⅛" Total wt lbs.	Ash. %
19.	Original coal	2365	17·5	1770	15·3	1575	14·4
20.	Washed coal	2034	13·0	1446	10·7	1246	13·7
21.	Refuse—coarse	290	46·3	220	36·5	44	61·1
22.	Hutch product	25	18·9	82	28·3	. .	. . .
23.	Jig slimes	. . . .	. . . .	43	16·1	. . . .	. . . .
24.	Table slimes	. . . .	. . . .	. . . .	. . . .	158	12·1

TABLE D.

Results of Washing (Totals).

25.	Original coal	wt. in lbs.	5710	% ash	15·5	% sulphur	0·8
26.	Washed coal	" "	4884	" "	12·7	" "	0·5
27.	Refuse	" "	554	" "	42·0	" "	. . . .
28.	Other products	" "	174	" "	. . . .	" "	. . . .
29.	Loss	" "	98	" "	. . . .	" "	. . . .

30. Loss in % 1·7·

TABLE E.

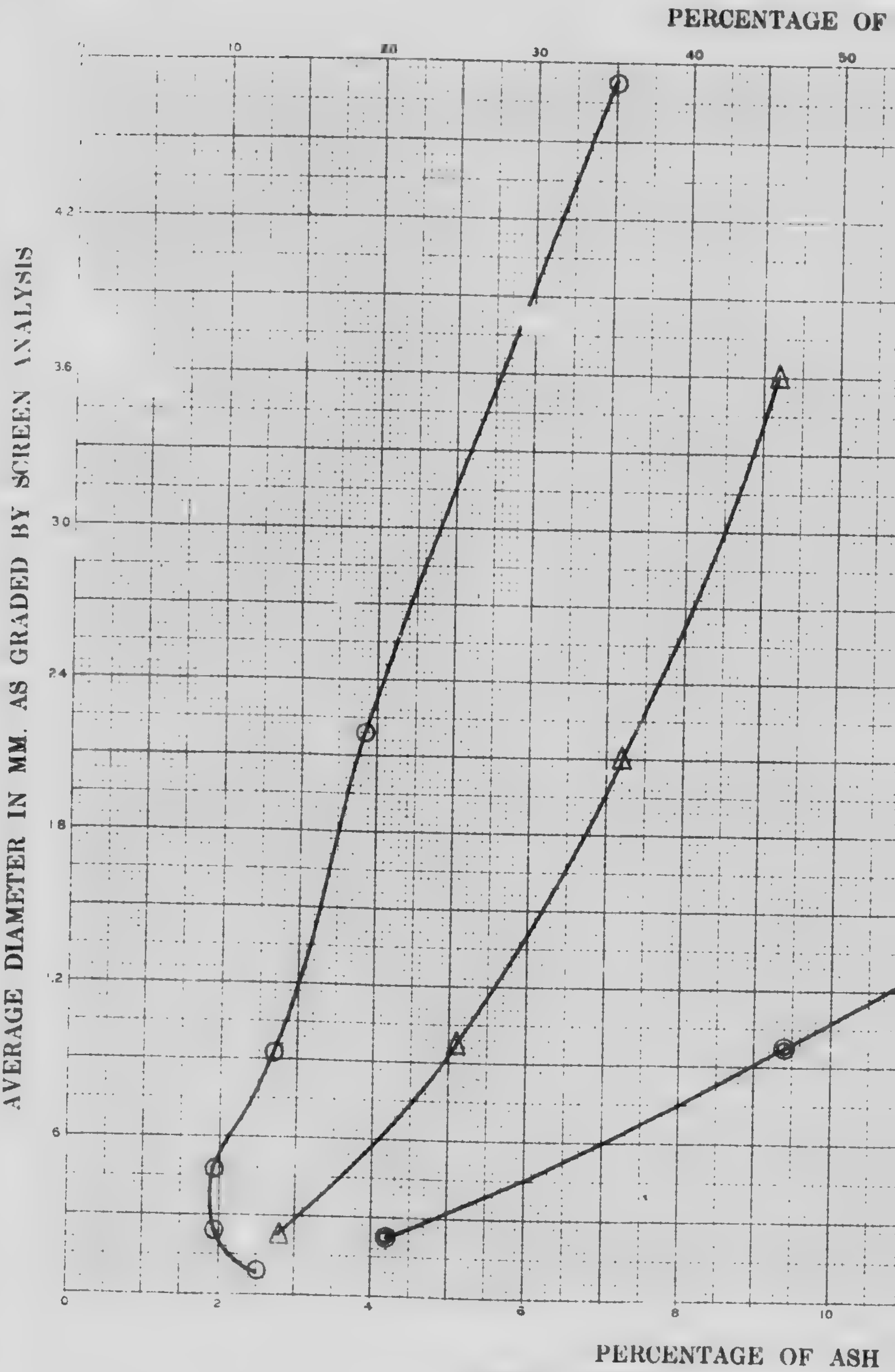
Summary Statement of Effect of Washing on Fuel Values.

31.	Recovery of washed coal, including good bone	%	85·5	Ratio to standard	97·7
32.	Reduction in ash	%	18·1	" "	74·7
33.	" " sulphur	%	37·5	" "	. . .
34.	Increase in calorific value—calorimeter	%	4·8		
35.	Increase in evaporation under boiler	%	2·4		
36.	Decrease in clinker under boiler	%	33·4		
37.	Fuel ratio of original coal		2·06		
38.	" " washed "		2·07		
39.	Calorific value of original coal		6880		
40.	" " washed "		7210		

Remarks on Tables C, D, and E.—Owing to the results of the preliminary tests, it was not considered necessary to wash this coal on a large scale, although, of course, it can be considerably improved by such treatment.

AVERAGE DIAMETER IN MM. AS GRADED BY SCREEN ANALYSIS

GRAPHIC RECORD OF SIZIN

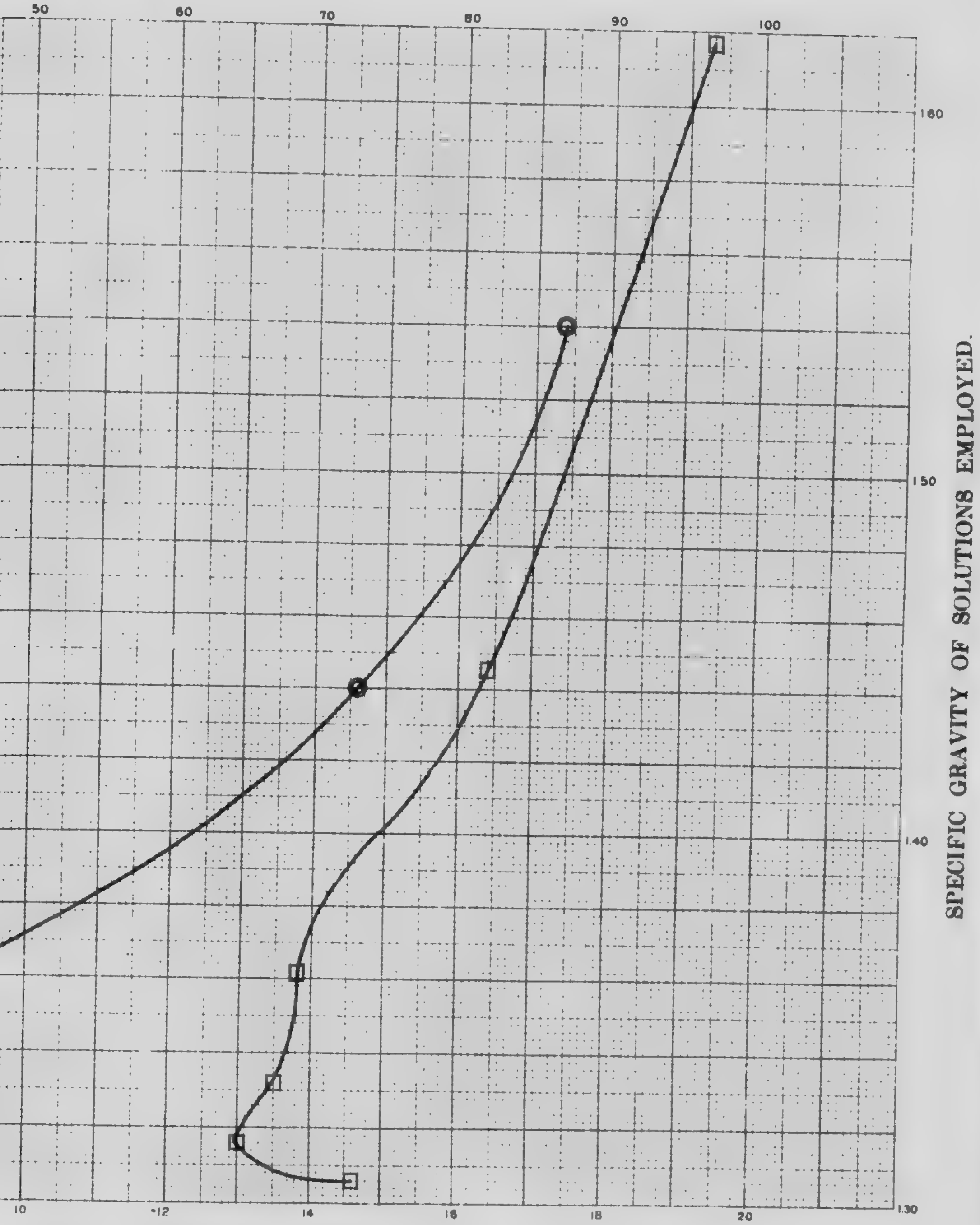


LEGEND: SYMBOLS.

○ Curve showing the relative quantities of the several sizes.
△ " " " " " " " densities.
▭ " " " percentage of ash in each of the several sizes.
◎ " " " " " " " material floating at the several de

IZING AND SPECIFIC GRAVITY TESTS.

GE OF SIZE AND OF FLOAT.



F ASH IN SIZE AND IN FLOAT.

COAL No. 33
Appendix I, Vol. III

several densities.

COAL.—No. 28.

Locality.—Lille, Alberta.

Colliery.—West Canadian Collieries, Ltd., Lille No. 1 seam.

Sample.—Sample of ten sacks of run of mine coal taken from workings about 5000 feet in on the main tunnel, and from 400 to 2000 feet to the rise. Sampled May 6, 1908.

TABLE A.

Specific Gravity Tests.

	Specific gravity of solution.	Float %	Ash in Float %	Sink %	Ash in Sink %
1.	1·520	83·6	7·0	16·4	61·8
2.	1·430	73·1	5·5	26·9	45·0
3.	1·360	58·4	4·0	41·6	33·7
4.	1·330	45·4	2·8	54·6	26·4

The following results are obtained from the above data, and from the chemist's results :—

5.	Good coal, Sp. Gr. under 1·375	% yield	62·5	% ash	4·4
6.	Bone coal, Sp. Gr., 1·375 to 1·55	“ “	23·0	“ “	15·1
7.	Useful coal—sum of (5) and (6)	“ “	85·5	“ “	7·3
8.	Refuse, Sp. Gr. over 1·55	“ “	14·5	“ “	66·0
9.	Assay of original sample raw coal as sent to chemist			“ “	16·4
10.	“ “ “ “ “ “			% sulphur	0·5
11.	“ “ “ “ “ “			Fuel Ratio	2·34
12.	Assay of mixed good and bone coal (5) and (6)			“ “	2·38

Remarks.—This coal has a medium quantity of innate ash, a large amount of bone, low in ash, and a large amount of refuse fairly high in ash. A considerable reduction in ash can be effected by washing, but the results would not be so good as if the percentage of bone were lower. The sample was not washed, as it was too small in amount, but the colliery has a washery which works on screenings and makes a product which is sufficiently free from ash to be coked with success.

Attention should be called to the fact that the refuse from washing this coal is quite combustible, although it carries over 60 per cent of ash. In practice it is used regularly at the washery for steam purposes.

TABLE B.

Screen Analysis.

	Maximum Screen MM.	Minimum Screen MM.	Mean MM.	% of whole sample	% Ash in size.
13.	6·34	3·16	4·75	40·2	18·1
14.	3·16	1·20	2·18	24·0	16·4
15.	1·20	0·64	0·92	14·7	15·4
16.	0·64	0·30	0·47	8·0	14·1
17.	0·30	0·173	0·24	6·5	12·8
18.	0·173	0·000	0·086	6·6	12·6

Remarks.—The sample is run of mine, and the amount of fine material is not high in the circumstances. The coal is of medium strength only, and much more friable than the ash-bearing material.

TABLE C.

Results of Washing (Details of Sizes.)

	Original coal and its products.	Sizes between 1" and ½" Total wt. lbs.	Ash. %	Sizes between ½" and ⅛" Total wt. lbs.	Ash. %	Sizes under ⅛" Total wt. lbs.	Ash. %
19.	Original coal ...	This coal was not washed.					
20.	Washed coal....						
21.	Refuse—coarse..						
22.	Hutch product..						
23.	Jig slimes.						
24	Table slimes....						

TABLE D.

Results of Washing (Totals).

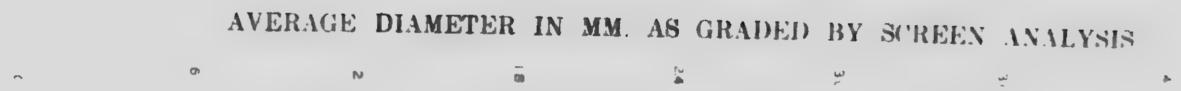
25. Original coal........................wt. in lbs. .... % ash .... % sulphur ...
26. Washed coal.... .. .. " " ... " " .... " " ...
27. Refuse.......................... " " .... " " .... " " ....
28. Other products.................... " " .... " " .... " " ....
29. Loss............................ " " ... " " ... " " ....
30. Loss in % ....

TABLE E.

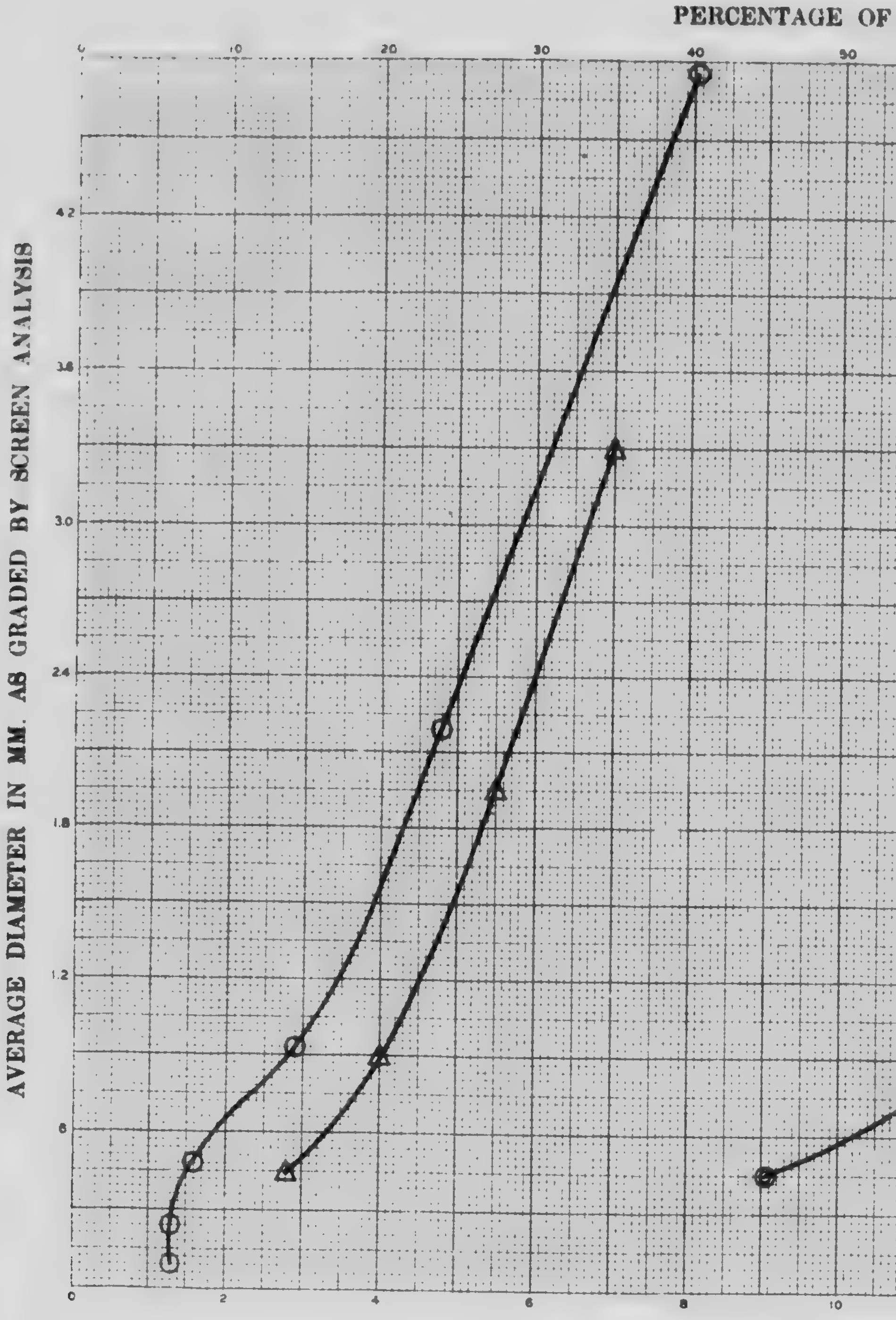
Summary Statement of Effect of Washing on Fuel Values.

31. Recovery of washed coal, including good bone....% .... Ratio to standard ....
32. Reduction in ash.... ....% .... " "
33. " " sulphur........................% . .. ..
34. Increase in calorific value—calorimeter..........%
35. Increase in evaporation under boiler..... .... ..%
36. Decrease in clinker under boiler...............%
37. Fuel ratio of original coal . .
38. " " washed "
39. Calorific value of original coal . . . . .
40. " " washed "

Remarks on Tables C, D. and E.—Owing to the small size of this sample, washing was not attempted. The colliery operates a washery for screenings, which are used for the manufacture of coke.


AVERAGE DIAMETER IN MM. AS GRADED BY SCREEN ANALYSIS
6
2
18
2.4
4

GRAPHIC RECORD OF SIZING

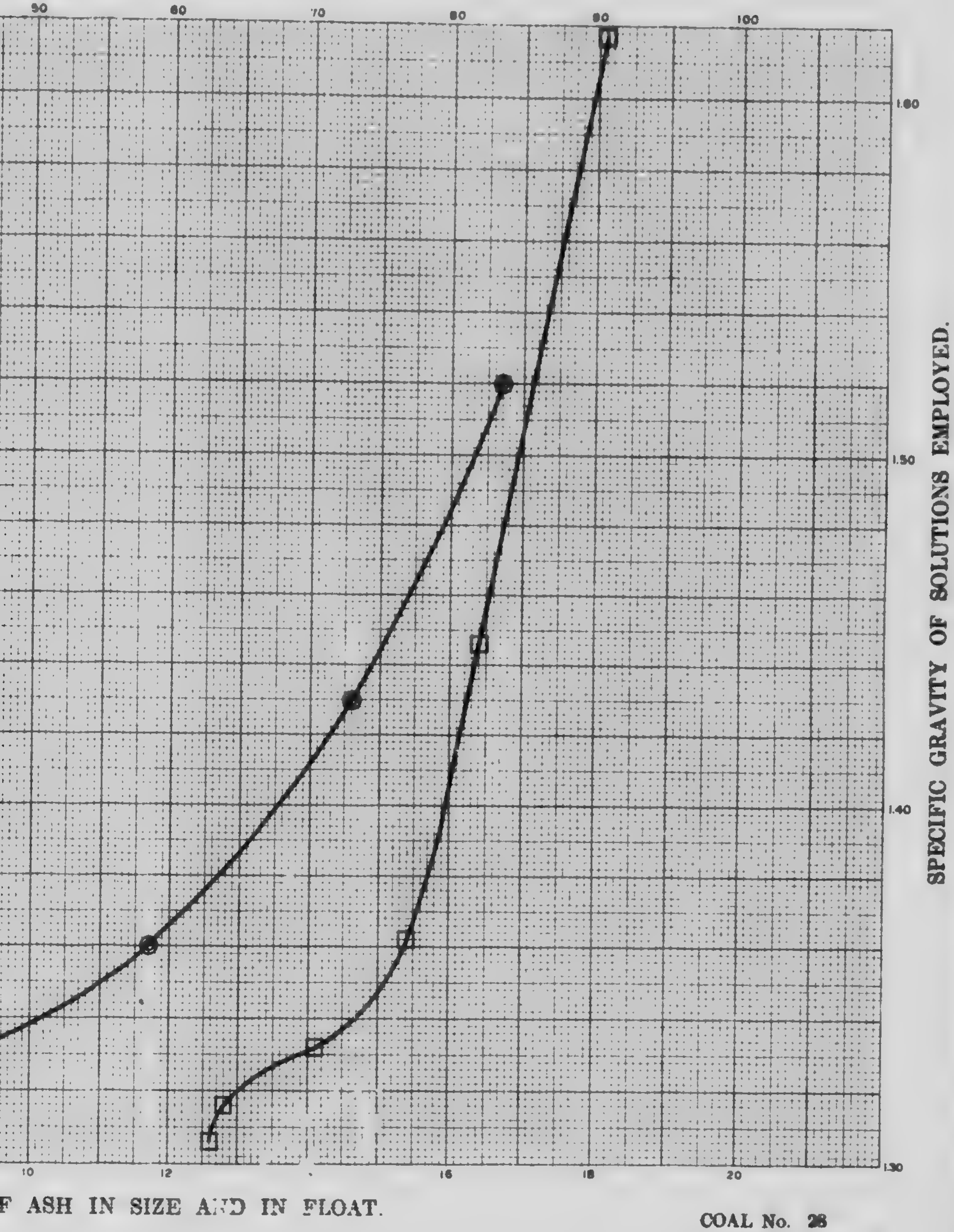


LEGEND: SYMBOLS.

○ Curve showing the relative quantities of the several si
△ " " " " " " " " densities.
□ " " " percentage of ash in each of the several sizes.
O " " " " " " " material floating at the several de

IZING AND SPECIFIC GRAVITY TESTS.

GE OF SIZE AND OF FLOAT.



COAL No. 28
APPENDIX I, VOL. III

s.
several densities.

COAL.—No. 34.

Locality.—Coleman, Alberta.

Colliery.—International Coal and Coke Co., Denison colliery, No. 2 seam.

Sample.—One hundred and twenty-eight sacks from No. 2 seam. The coal chosen was run of mine, shovelled from cars from chutes distant between 4200 and 6600 feet from the mouth of the mine entry. Sampled May 10, 1908.

TABLE A.

Specific Gravity Tests.

	Specific gravity of solution	Float %	Ash in Float %	Sink %	Ash in Sink %
1.	1·540	75·7	8·5	24·3	54·7
2.	1·420	67·2	7·9	32·8	43·3
3.	1·370	46·6	3·9	53·4	31·1
4.	1·320	23·5	2·0	76·5	24·5

The following results are obtained from the above data, and from the chemists results :—

5.	Good coal, Sp. Gr. under 1·375	% yield	48·5	% ash	4·4
6.	Bone coal, Sp. Gr. 1·375 to 1·55	" "	27·5	" "	17·7
7.	Useful coal—sum of (5) and (6)	" "	76·0	" "	8·5
8.	Refuse, Sp. Gr. over 1·55	" "	24·0	" "	55·5
9.	Assay of original sample raw coal as sent to chemist			" "	19·8*
10	" " " " " "			% sulphur	0·4
11.	" " " " " "			Fuel Ratio	2·22
12.	Assay of mixed good and bone coal (5) and (6)			" "	2·35

* It may be noted that several other samples from this seam, taken earlier and later for other purposes, all ran a little lower in ash than this main sample. It is, therefore probable that, the above-named sample included some unusually low grade material. The variation would not, however, amount to more than say 2 per cent.

Remarks.—The coal contains a medium proportion of innate ash, and large amounts both of bone and refuse, which contain moderate percentages of ash. It can be considerably improved by washing, although it can never produce a very high grade product, owing to the considerable amount of medium bone, which carries a good deal of ash, and yet is too valuable to be thrown away.

TABLE B

Screen Analysis.

	Maximum Screen MM.	Minimum Screen MM.	Mean MM	% of whole sample	% Ash in size
13.	6·34	3·16	4·75	12·6	18·6
14.	3·16	1·20	2·18	35·6	19·2
15.	1·20	0·64	0·92	20·7	18·2
16.	0·64	0·30	0·47	11·3	16·2
17.	0·30	0·173	0·24	9·4	16·0
18	0·173	0·000	0·086	10·4	16·9

Remarks.—This coal is quite triable, although not as markedly so as that from the Coal Creek district. It might be noted that the two millimetre size contains the largest amount of ash, both coarser and finer materials being somewhat cleaner. This same fact has been noticed in several other coals in the district .

TABLE C.

Results of Washing (Details of Sizes).

	Original coal and its products.	Sizes between 1" and ½" Total wt lbs.	Ash. %	Sizes between ½" and ¼" Total wt. lbs.	Ash. %	Sizes under ¼" Total wt. lbs.	Ash. %
19.	Original coal	2490	22·4	2522	19·0	1246	16·8
20.	Washed coal..........	1773	13·7	1692	10·9	906	11·1
21.	Refuse—coarse.... . .	581	50·0	704	44·5	76	66·8
22	Hutch product.....	82	....	46	12·2	.	
23.	Jig slimes.	....	....	62	18·1	..	.
24.	Table slimes.......... ...	....	....	....	...	197	13·2

TABLE D

Results of Washing (Totals).

25.	Original coal	wt. in lbs.	6258	% ash	19·8	% sulphur	0·4
26.	Washed coal........................	" "	4568	" "	11·6	" "	0·4
27.	Refuse	" "	1361	" "	47·6	" "	.
28.	Other products........................	" "	258	" "	....	" "	
29.	Loss........................	" "	71	" "	...	" "	...
30.	Loss in % 1·1.						

TABLE E.

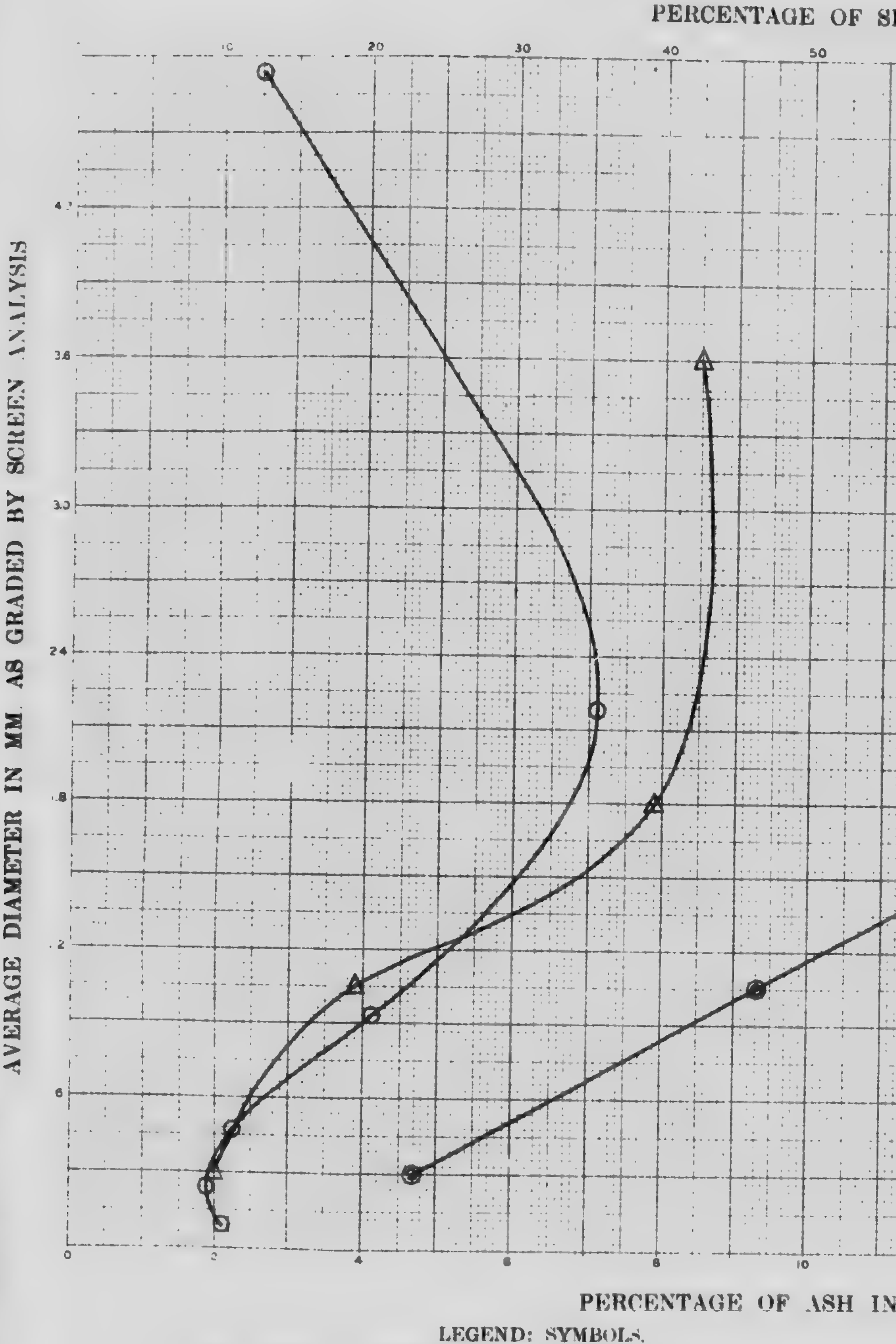
Summary Statement of Effect of Washing on Fuel Values.

31.	Recovery of washed coal, including good bone. ..	%	73·2	Ratio to standard	96·3
32.	Reduction in ash	%	41·4	" "	73·3
33.	" " sulphur.	%	....	" ..	
34.	Increase in calorific value—calorimeter..........	%	12·4		
35.	Increase in evaporation under boiler	%	9·3		
36.	Decrease in clinker under boiler................	%	57·4		
37.	Fuel ratio of original coal......................		2·22		
38.	" " washed "		2·35		
39.	Calorific value of original coal.		6510		
40.	" " washed "		7320		

Remarks on Tables C, D, and E.—The result of this trial was fairly satisfactory, although a better reduction of ash could easily be made in a commercial operation.

AVERAGE DIAMETER IN MM AS GRADED BY SCREEN ANALYSIS
4

GRAPHIC RECORD OF SIZING A

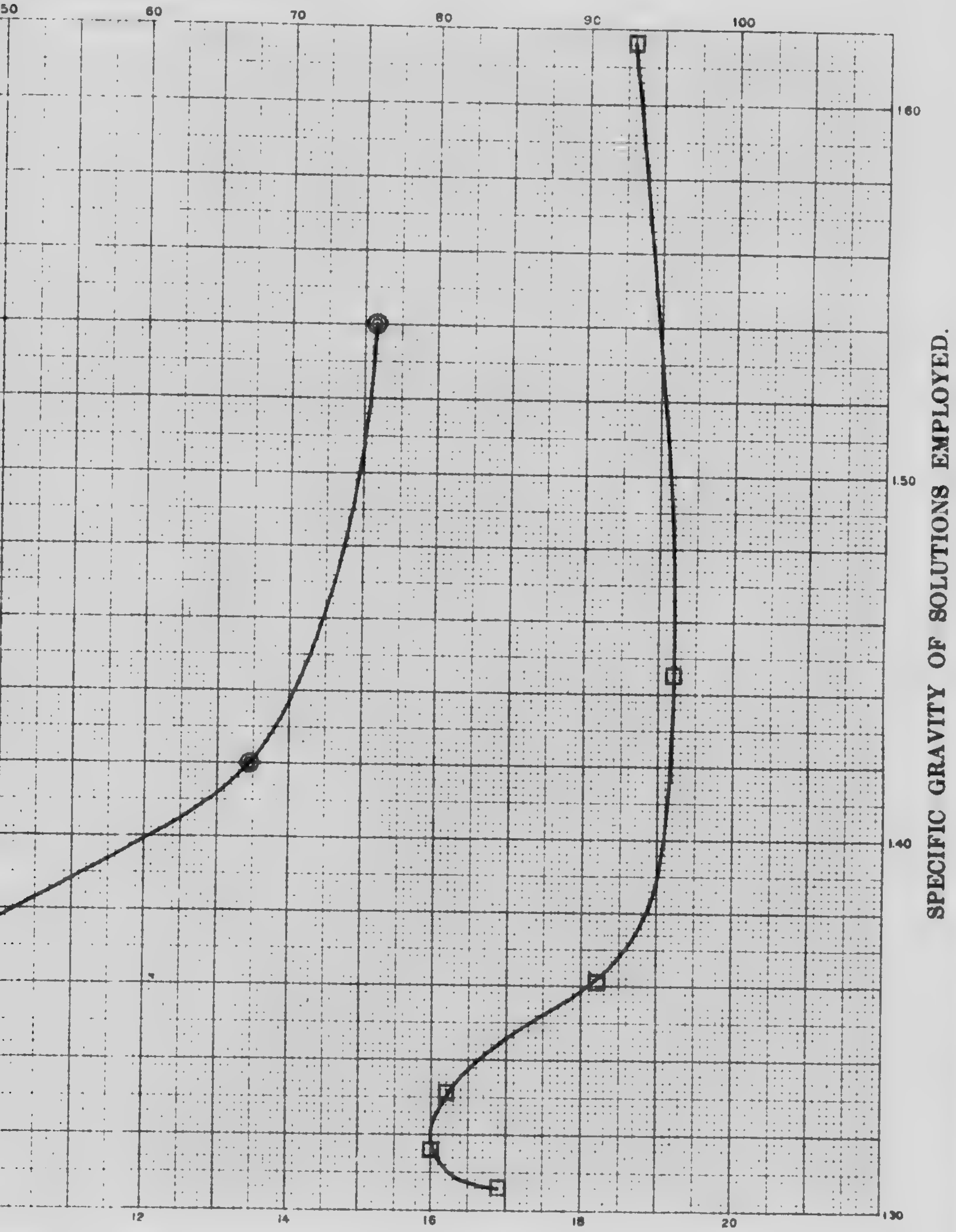


LEGEND: SYMBOLS.

○ Curve showing the relative quantities of the several sizes.
△ " " " " " " " " densities.
◌ " " " percentage of ash in each of the several sizes.
◎ " " " " " " " " material floating at the several densit

ING AND SPECIFIC GRAVITY TESTS.

G OF SIZE AND OF FLOAT.



ASH IN SIZE AND IN FLOAT.

COAL No. 34
APPENDIX I, VOL. III

eral densities.

COAL.—No. 34 SP.

Locality.—Coleman, Alberta.

Colliery.—International Coal and Coke Co., Denison colliery, No. 4 seam.

Sample.—Sample of twelve sacks from No. 4 seam, taken from one car each, from chutes at 790, 840, 1140, 3,000, and 5,700 feet from the entrance, respectively. The sample is run of mine, roughly hand picked. Sampled May 10, 1908.

TABLE A.

Specific Gravity Tests.

	Specific gravity of solution.	Float %	Ash in Float %	Sink %	Ash in Sink %
1.	1·525............	84·2	9·5	15·8	47·5
2.	1·420............	60·1	6·0	39·9	31·2
3.	1·370............	46·6	5·2	53·4	25·9
4.	1·320............	26·2	3·3	73·8	20·6

The following results are obtained from the above data, and from the chemist's results :—

5.	Good coal, Sp. Gr. under 1·375......................	% yield	48·0	% ash	5·3
6.	Bone coal, Sp. Gr. 1·375 to 1·55....................	" "	41·5	" "	16·3
7.	Useful coal—sum of (5) and (6)......................	" "	89·5	" "	10·2
8.	Refuse, Sp. Gr. over 1·55...........................	" "	10·5	" "	51·9
9.	Assay of original sample raw coal as sent to chemist..............			" "	16·2
10.	" " " " " "			% sulphur	0·6
11.	" " " " " "			Fuel Ratio	2·52
12.	Assay of mixed good and bone coal (5) and (6)..................			" "	2·64

Remarks.—This coal is high in innate ash, and contains very large amounts of bone coal, and a large amount of refuse, each fairly low in ash. The coal is not very suitable for ash reduction by washing, on account of the character of its bone.

TABLE B.

Screen Analysis.

	Maximum Screen MM.	Minimum Screen MM.	Mean MM.	% of whole sample	% Ash in size
13.	6·34	3·16	4·75	17·4	14·4
14.	3·16	1·20	2·18	22·1	17·4
15.	1·20	0·64	0·92	18·3	15·7
16.	0·64	0·30	0·47	13·5	14·8
17.	0·30	0·173	0·24	13·0	14·9
18.	0·173	0·000	0·086	15·7	15·8

Remarks.—The coal is quite friable, and shows the peculiarity mentioned for coal 34 and others, viz., that the proportion of two millimetre stuff is exceptionally large and carries the highest percentage of ash.

TABLE C.

Results of Washing (Details of Sizes.)

	Original coal and its products.	Sizes between 1" and ½" Total wt. lbs.	Ash. %	Sizes between ½" and ⅛" Total wt. lbs.	Ash. %	Sizes under ⅛" Total wt. lbs.	Ash. %
19.	Original coal . . .						
20.	Washed coal. . . .						
21.	Refuse—coarse. .	This coal was not washed.					
22.	Hutch product. .						
23.	Jig slimes.						
24.	Table slimes						

TABLE D.

Results of Washing (Totals).

25. Original coal . . . . wt. in lbs. . . . % ash . . . . % sulphur
26. Washed coal. " " . . . . " " . . . . " "
27. Refuse. . . . . " " . . . . " " . . . . " "
28. Other products. . . . . " " . . . . " " . . . . " "
29. Loss. . . . . " " . . . . " " . . . . " "
30. Loss in %.

TABLE E.

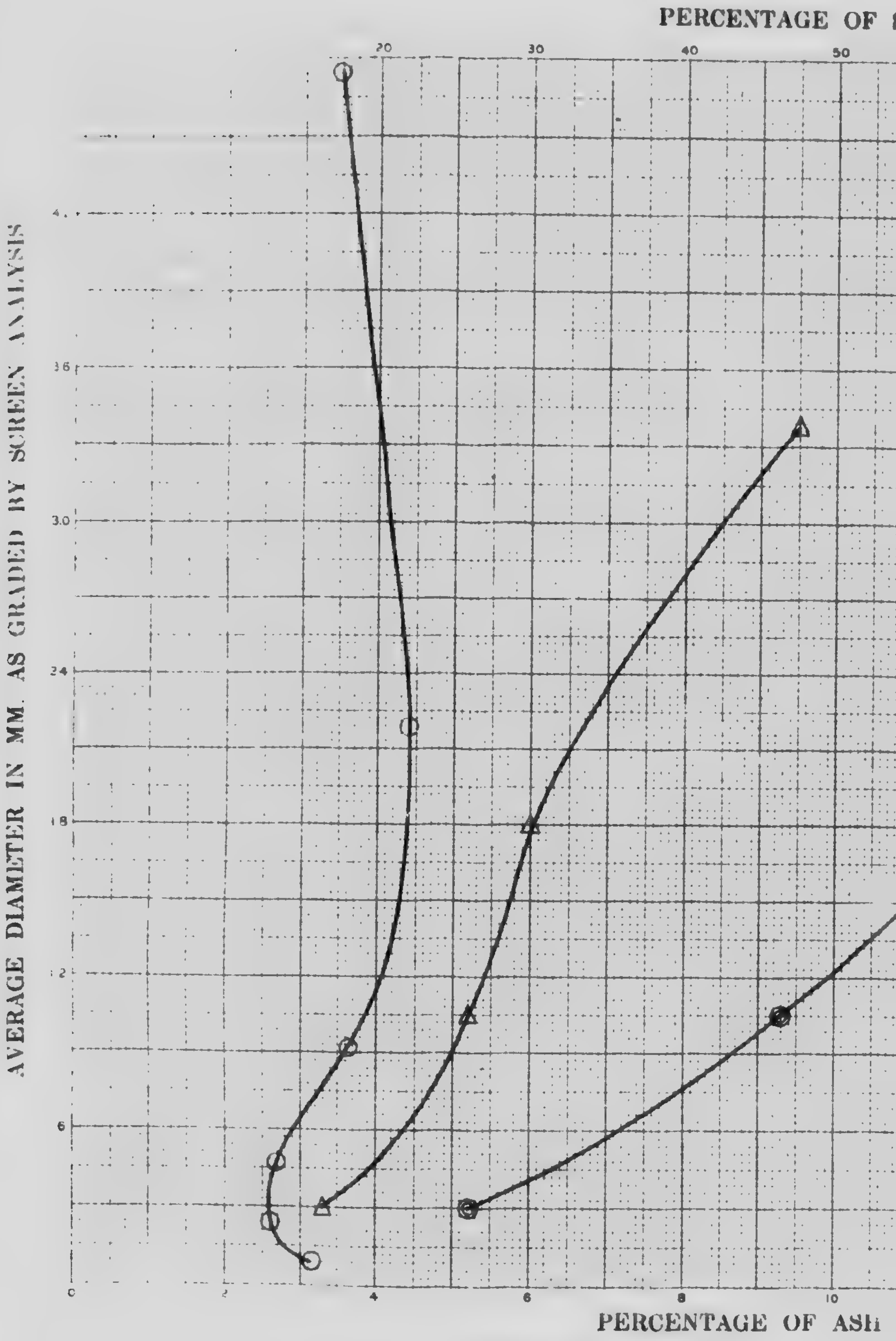
Summary Statement of Effect of Washing on Fuel Values.

31. Recovery of washed coal, including good bone. . % . . . . Ratio to standard . . .
32. Reduction in ash. . . . . % . . . . " "
33. " " sulphur. . . . . % . . . . " "
34. Increase in calorific value—calorimeter . . . . %
35. Increase in evaporation under boiler. . . . . %
36. Decrease in clinker under boiler . . . . %
37. Fuel ratio of original coal. . . . . .
38. " " washed " . . . . . .
39. Calorific value of original coal. . . .
40. " " washed " . . . . . .

Remarks on Tables C, D, and E.—Owing to the small quantity of this sample, and also to the results of the specific gravity tests, it was considered unnecessary to make any washing trial.

AVERAGE DIAMETER IN MM. AS GRADED BY SCREEN ANALYSIS.

GRAPHIC RECORD OF SIZING

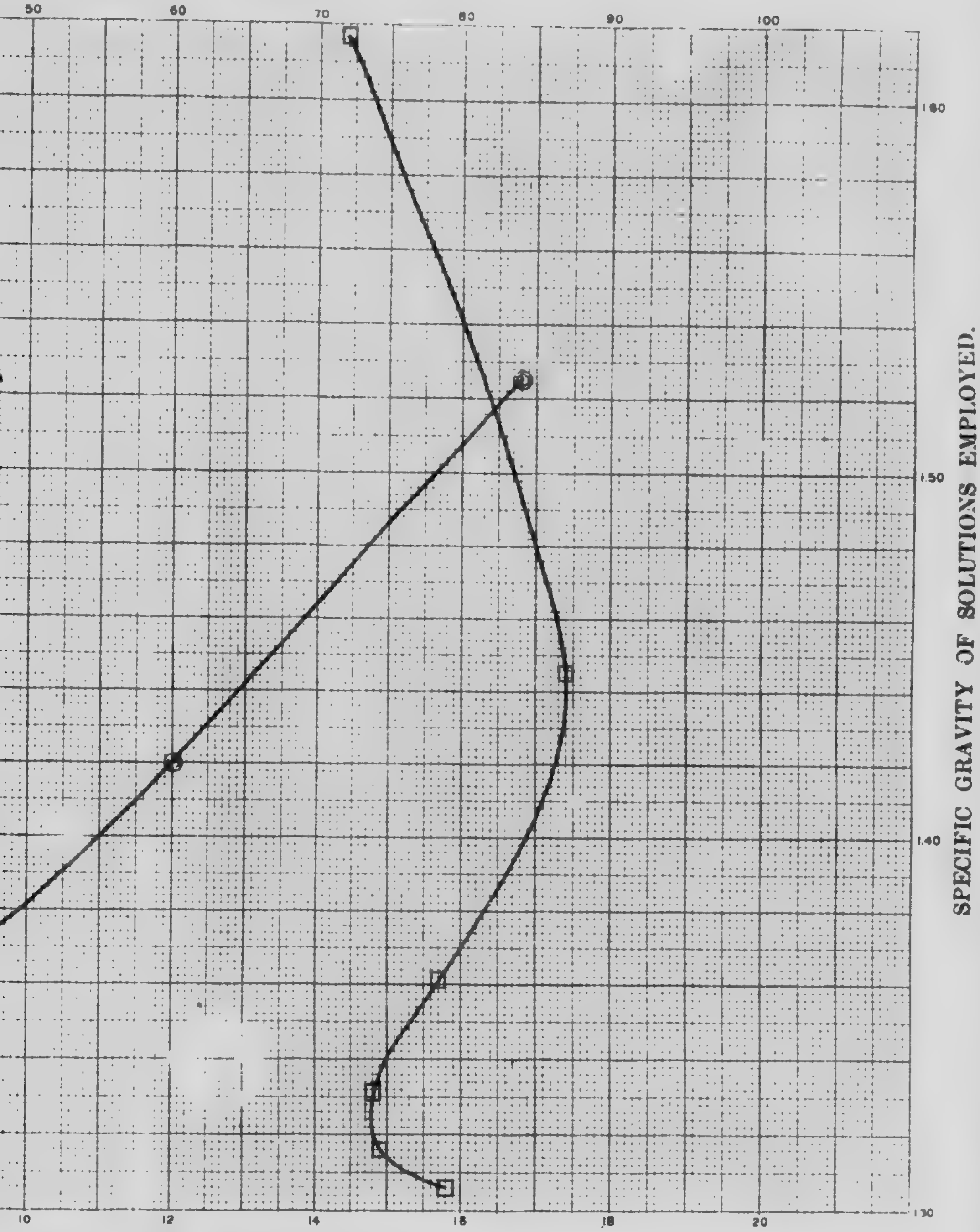


LEGEND: SYMBOLS.

○ Curve showing the relative quantities of the several sizes.
△ " " " " " " " " densities.
◎ " " " percentage of ash in each of the several sizes.
O " " " " " " " material floating at the several de

ZING AND SPECIFIC GRAVITY TESTS.

E OF SIZE AND OF FLOAT.



COAL No. 34 S.P
Appendix I, Vol. III

several densities.

THE WESTERN CROWSNEST PASS,
OR ELK RIVER-FERNIE FIELD.

ERRATUM

On the curve diagrams accompanying the tabulated records of each of the coals tested, is the following legend:—

LEGEND: SYMBOLS

○ Curve showing the relative quantities of the several sizes.
△ " " " " " " " " densities.
□ " " " percentage of ash in each of the several sizes
◉ " " " " " " " material floating at the several densities.

The above legend is incorrect; in each case it should read thus:—

○ Curve showing the relative quantities of the several sizes.
□ " " " percentage of ash in each of the several sizes.
◉ " " " " " material floating at the several densities.
△ " " " " ash in " " " " " "

COAL.—No. 31.

Locality.—Michel, B.C

Colliery.—Crowsnest Pass Coal Co., Michel colliery No. 3.

Sample.—One hundred and fifty bags taken from cars as they came from the mine, which was being reopened. The coal was screened over bars set 2″ apart, and this represents less than one-third of the run of mine, over two-thirds being so fine as to run through the bars. Sampled April 30. 1908.

TABLE A.

Specific Gravity Tests.

	Specific gravity of solution.	Float %	Ash in Float %	Sink %	Ash in Sink %
1.	1·515	88·1	6·9	11·9	54·8
2.	1·425	85·0	5·8	15·0	51·2
3.	1·380	78·1	3·4	21·9	43·5
4.	1·330	63·4	2·8	36·5	31·5

The following results are obtained from the above data, and from the chemists results :—

5.	Good coal, Sp. Gr. under 1·375	% yield	77·4	% ash	3·3
6.	Bone coal, Sp. Gr. 1·375 to 1·55	" "	10·6	" "	32·9
7.	Useful coal—sum of (5) and (6)	" "	88·0	" "	6·8
8.	Refuse, Sp. Gr. over 1·55	" "	12·0	" "	57·3
9.	Assay of original sample raw coal as sent to chemist			" "	12·5
10.	" " " " " "			% sulphur	0·5
11.	" " " " " "			Fuel Ratio	2·53
12.	Assay of mixed good and bone coal (5) and (6)			" "	2·66

Remarks.—The innate ash is low ; the bone coal is fairly high, and carries a large amount of ash, while the refuse is large in amount, with medium ash. The coal can therefore, be considerably improved by washing.

TABLE B

Screen Analysis.

	Maximum Screen MM.	Minimum Screen MM.	Mean MM.	% of whole sample	% Ash in size.
13.	6·34	3·16	4·75	41·1	19·1
14.	3·16	1·20	2·18	20·1	13·7
15.	1·20	0·64	0·92	14·1	11·7
16.	0·64	0·30	0·47	8·9	8·3
17.	0·30	0·173	0·24	7·9	7·5
18.	0·173	0·000	0·086	7·9	7·9

Remarks.—This coal is similar to the others from the immediate neighbourhood, although its average ash is higher. The coal, itself, is very friable, while the ash-bearing material is comparatively strong. It should be noted that this sample, and the others from the same district, are of lump coal from which all the slack has been removed by screening.

TABLE C.

Results of Washing (Details of Sizes).

	Original coal and its products.	Sizes between 1" and ½" Total wt. lbs.	Ash %	Sizes between ½" and ¼" Total wt. lbs.	Ash %	Sizes under ¼" Total wt. lbs.	Ash %
19.	Original coal ...	2441	17·4	1609	9·8	1955	9·0
20.	Washed coal	1900	8·4	1379	5·6	1642	4·6
21.	Refuse—coarse	434	51·3	144	47·3	74	54·8
22.	Hutch product	78	20·0	81	23·6		
23.	Jig slimes			51	11·2		
24.	Table slimes						

TABLE D.

Results of Washing (Totals).

25.	Original coal	wt. in lbs.	6005	% ash	12·5
26.	Washed coal	" "	4921	" "	6·2
27.	Refuse	" "	652	" "	50·2
28.	Other products	" "	340	" "	
29.	Loss	" "	92	" "	
30.	Loss in % 1·5				

TABLE E.

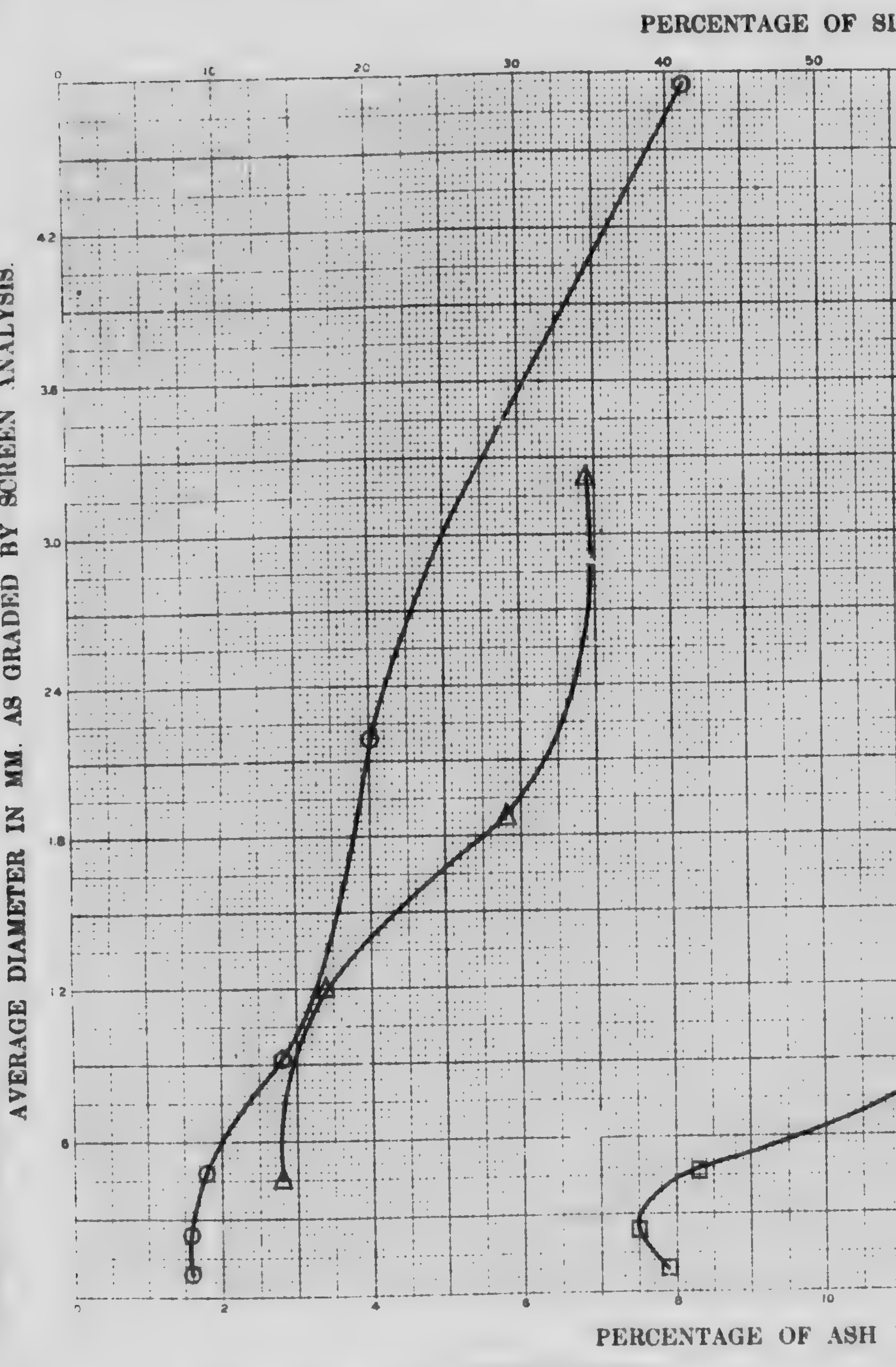
Summary Statement of Effect of Washing on Fuel Values.

31.	Recovery of washed coal, including good bone. .. %	82·0	Ratio to standard	93·7
32.	Reduction in ash .... %	50·4	" "	109·2
33.	" " sulphur .... %	....	" "	
34.	Increase in calorific value—calorimeter .... %	7·9		
35.	Increase in evaporation under boiler .... %	5·3		
36.	Decrease in clinker under boiler .... %	59·8		
37.	Fuel ratio of original coal	2·53		
38.	" " washed "	2·70		
39.	Calorific value of original coal	7370		
40.	" " washed "	7950		

Remarks on Tables C, D, and E.—This washing test may be considered a very satisfactory one, although the loss is higher than would have been the case in a commercial operation. It must be noted that this sample is of screened coal, and, therefore, presumably of better quality than the ordinary run of mine. Possibly the latter would be more suitable for washing, particularly as it is largely used for the manufacture of coal, in which ash is very undesirable.

AVERAGE DIAMETER IN MM. AS GRADED BY SCREEN ANALYSIS

GRAPHIC RECORD OF SIZING A



LEGEND: SYMBOLS.

○ Curve showing the relative quantities of the several sizes.
△ " " " " " " " densities.
" " percentage of ash in each of the several sizes.
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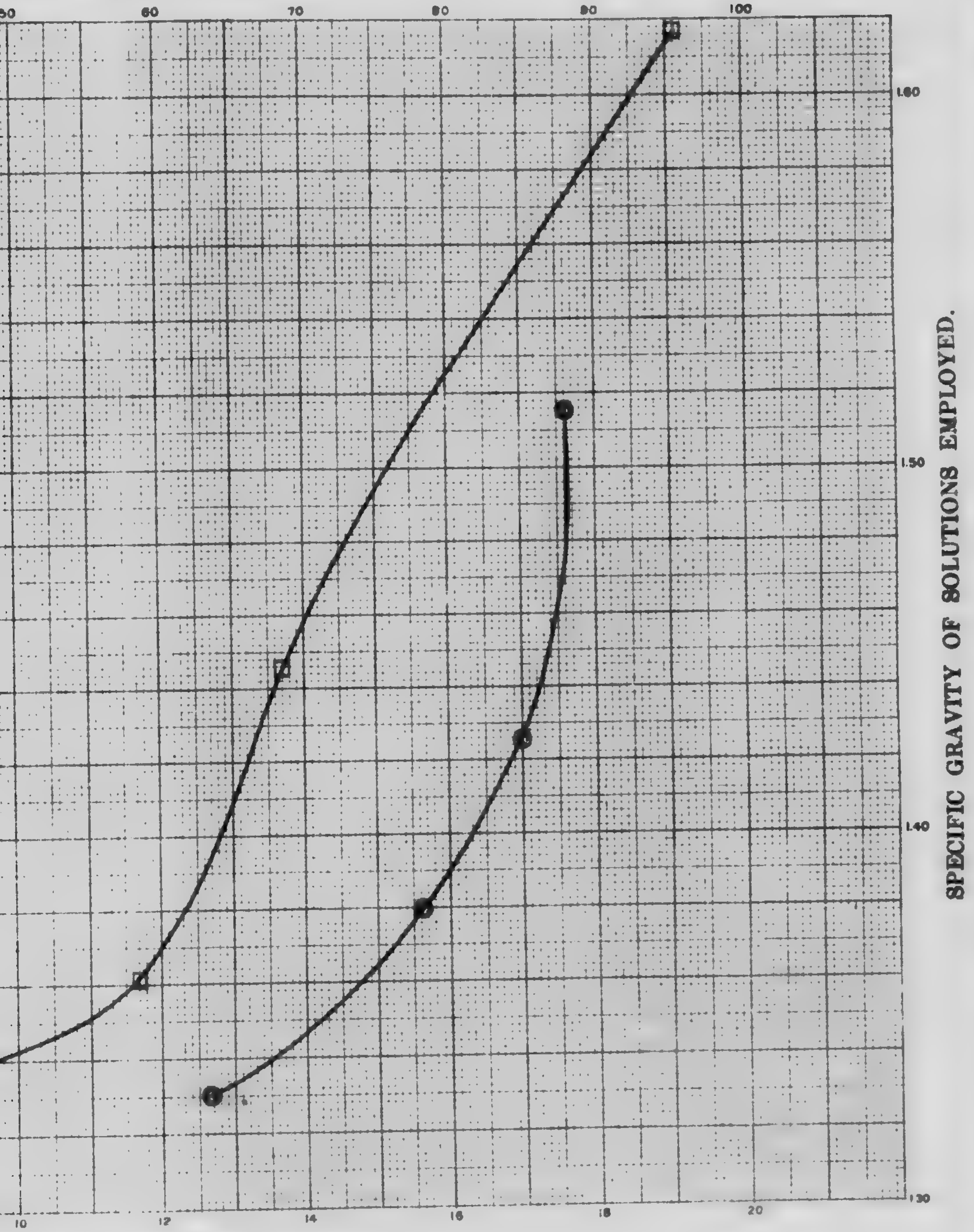
NG AND SPECIFIC GRAVITY TESTS.

OF SIZE AND OF FLOAT.



ASH IN SIZE AND IN FLOAT.

COAL No. 31
Appendix I, Vol. III

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COAL.—No. 30.

Locality.—Michel, B.C.

Colliery.—Crowsnest Pass Coal Co., Michel, No. 7 mine.

Sample.—One hundred and fifty bags from a new mine, which was, at the time, undergoing development. The sample was taken from sixteen mine cars, selected from different parts of the mine. The coal was screened on 2″, and then run over the picking belt. Sampled April 29, 1908.

TABLE A.

Specific Gravity Tests.

	Specific gravity of solution.	Float %	Ash in Float %	Sink %	Ash in Sink %
1.	1·525	89·3	6·0	10·5	55·6
2.	1·420	83·8		16·2	43·0
3.	1·370	80·3	4·3	19·7	42·0
4.	1·320	68·4	3·5	31·7	27·5

The following results are obtained from the above data, and from the chemists results :—

5. Good coal, Sp. Gr. under 1·375 ....% yield 80·8 % ash 4·3
6. Bone coal, Sp. Gr. 1·375 to 1·55 .... " " 9·2 " " 23·2
7. Useful coal—sum of (5) and (6) .... " " 90·0 " " 6·2
8. Refuse, Sp. Gr over 1·55 .... " " 10·0 " " 60·0
9. Assay of original sample raw coal as sent to chemist .... " " 11·9
10. " " " " " " ....% sulphur 0·4
11. " " " " " " ....Fuel Ratio 2·90
12. Assay of mixed good and bone coal (5) and (6) .... " 3·09

Remarks.—The innate ash is medium in amount ; the bone coal is rather low, but with high ash ; and the refuse is considerable, also with high ash. The ash can, therefore, be reduced considerably by washing.

TABLE B.

Screen Analysis.

	Maximum Screen MM.	Minimum Screen MM.	Mean MM	% of whole sample	% Ash in size
13.	6·34	3·16	4·75	43·0	15·5
14.	3·16	1·20	2·18	16·4	10·3
15.	1·20	0·64	0·92	13·3	9·2
16.	0·64	0·30	0·47	9·4	8·4
17.	0·30	0·173	0·24	8·7	8·2
18.	0·173	0·000	0·086	9·2	9·6

Remarks.—The coal is very similar to others from the same field, but is somewhat less friable. It may be noted, however, that the fine sizes contain more ash than do the same sizes in the other coals of the same district.

TABLE C.

Results of Washing (Details of Sizes).

	Original coal and its products.	Sizes between 1" and ½" Total wt. lbs.	Ash. %	Sizes between ½" and ¼" Total wt. lbs.	Ash. %	Sizes under ¼" Total wt. lbs.	Ash. %
19.	Original coal . . .	This sample was not washed.					
20.	Washed coal. . . .						
21.	Refuse—coarse. .						
22.	Hutch product. .						
23.	Jig slimes.						
24.	Table slimes. . .						

TABLE D.

Results of Washing (Totals).

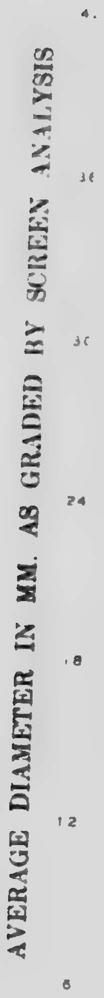
25.	Original coal	wt. in lbs.	% ash	% sulphur . . .
26.	Washed coal:	" "	" "	" " . . .
27.	Refuse.	" "	" "	" "
28.	Other products.	" "	" "	" "
29.	Loss.	" "	" "	" "
30.	Loss in %			

TABLE E.

Summary Statement of Effect of Washing on Fuel Values.

31. Recovery of washed coal, including good bone. . . . %
32. Reduction in ash . . . . % . . . . Ratio to standard
33. " " sulphur. . . . . % . . . . " "
34. Increase in calorific value—calorimeter . . . . % . . . . " " . . . .
35. Increase in evaporation under boiler. . . . . %
36. Decrease in clinker under boiler. . . . . %
37. Fuel ratio of original coal. . . . .
38. " " washed " . . . . . .
39. Calorific value of original coal. . . .
40 " " washed " . . . .

Remarks on Tables C, D, and E.—The results of preliminary tests were such that it was not considered necessary to wash this coal.


AVERAGE DIAMETER IN MM. AS GRADED BY SCREEN ANALYSIS
6
12
18
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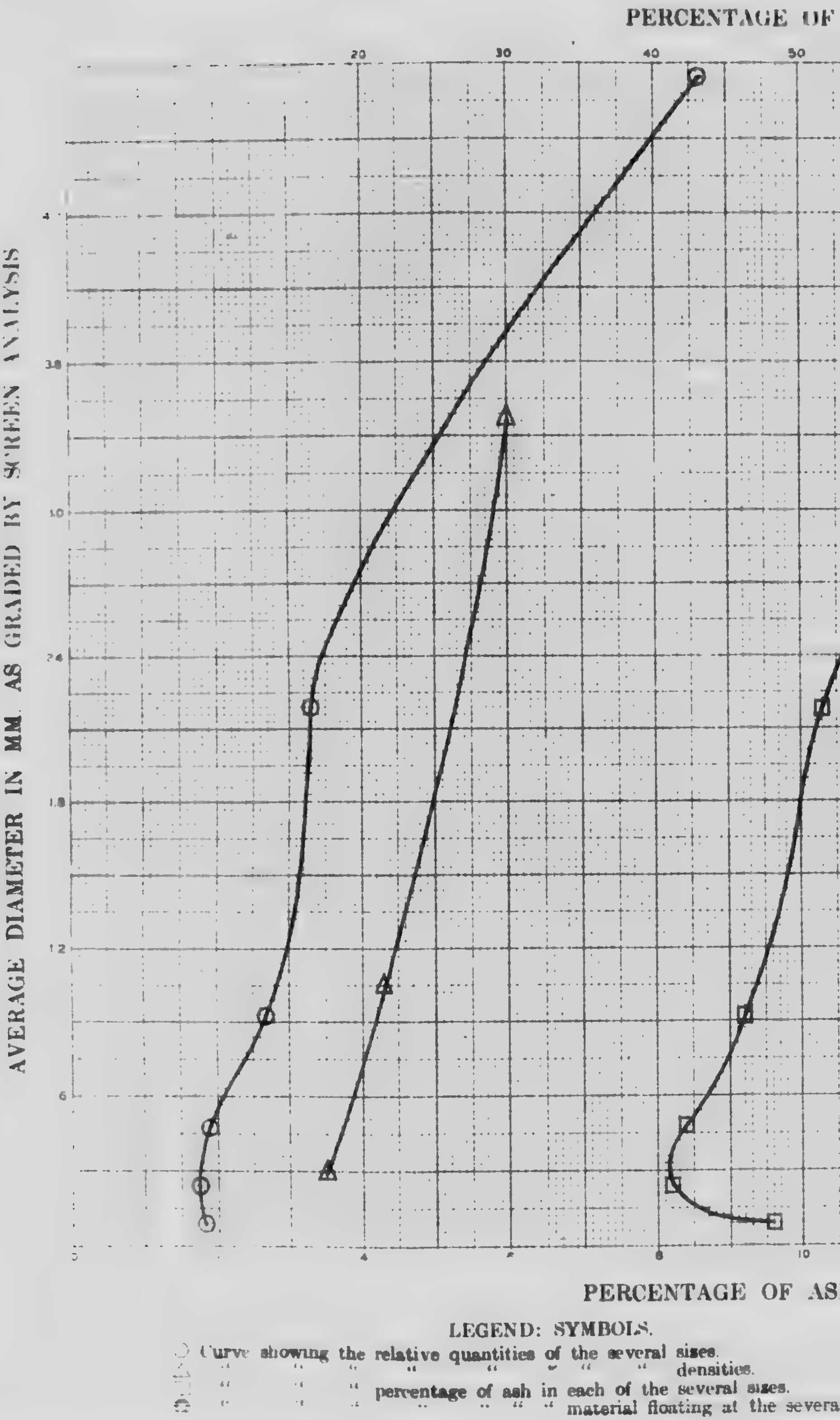
GRAPHIC RECORD OF SIZING

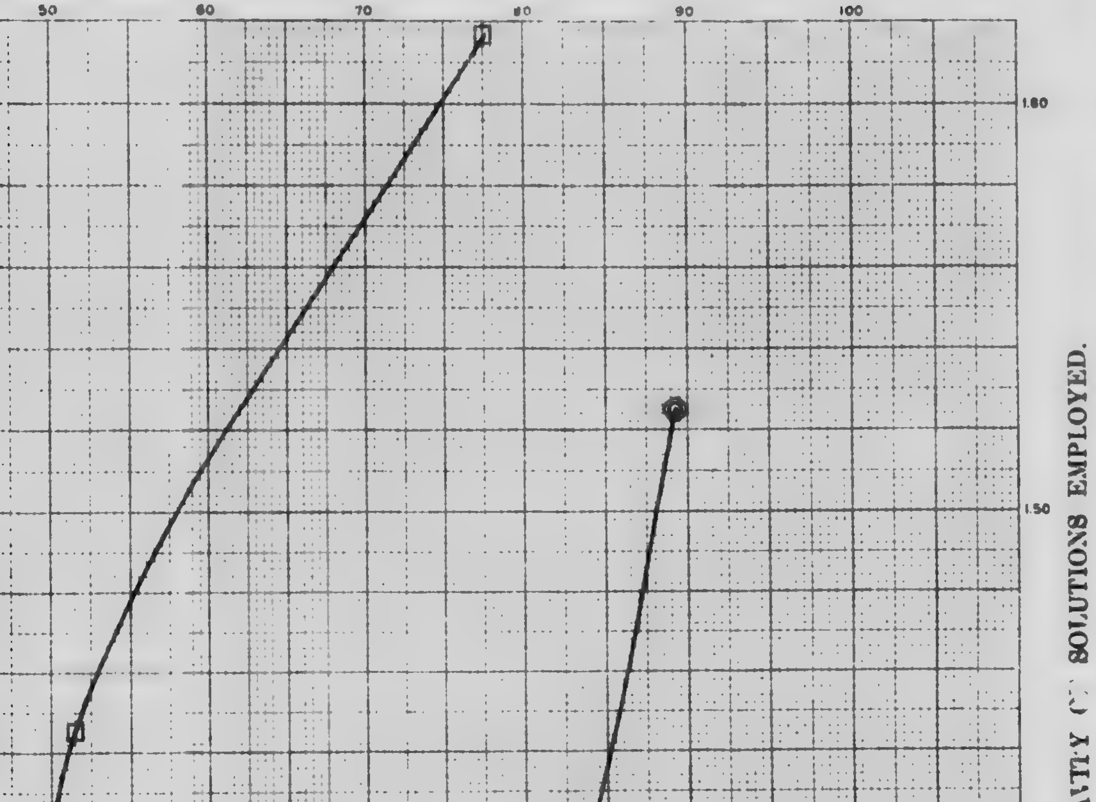


LEGEND: SYMBOLS.

○ Curve showing the relative quantities of the several sizes.
△ " " " " " " " densities.
□ " " " percentage of ash in each of the several sizes.
⊙ " " " " " " " material floating at the severa

IZING AND SPECIFIC GRAVITY TESTS.

GE OF SIZE AND OF FLOAT.



OF ASH IN SIZE AND IN FLOAT.

COAL No. 30
APPENDIX I, VOL. III

sizes.
the several densities

COAL.—No. 29.

Locality.—Michel, B.C.

Colliery.—Crowsnest Pass Coal Co., Michel colliery, No. 8 mine.

Sample.—One hundred and seventy-five sacks, chiefly drawn from No. 2 district, where the face is about 1,500 feet from the mouth of the tunnel. The sample had been screened on 2", and then hand picked by boys. Sampled April 28, 1908.

TABLE A.

Specific Gravity Tests.

	Specific gravity of solution.	Float %	Ash in Float %	Sink %	Ash in Sink %
1.	1·535	89·7	4·6	10·3	58·7
2.	1·415	84·1	3·7	15·9	45·0
3.	1·375	80·0	3·2	20·0	38·0
4.	1·325	72·0	2·6	28·0	29·4

The following results are obtained from the above data, and from the chemists results :—

5.	Good coal, Sp. Gr. under 1·375	% yield	80·0	% ash	3·2
6.	Bone coal, Sp. Gr. 1·375 to 1·55	" "	10·0	" "	17·7
7.	Useful coal—sum of (5) and (6)	" "	90·0	" "	4·6
8.	Refuse, Sp. Gr. over 1·55	" "	10·0	" "	60·0
9.	Assay of original sample raw coal as sent to chemist			" "	10·2
10.	" " " " " "			% sulphur	0·6
11.	" " " " " "			Fuel Ratio	2·72
12.	Assay of mixed good and bone coal (5) and (6)			" "	2·80

Remarks.—This coal is similar to that from Coal Creek, but the bone is exceedingly low in ash. As a large proportion of the impurity is in the refuse, the coal would wash well if it were considered necessary.

TABLE B

Screen Analysis.

	Maximum Screen MM.	Minimum Screen MM.	Mean MM.	% of whole sample	% Ash in size
13.	6·34	3·16	4·75	31·0	14·9
14.	3·16	1·20	2·18	16·9	13·1
15.	1·20	0·64	0·92	14·0	11·5
16.	0·64	0·30	0·47	11·0	9·5
17.	0·30	0·173	0·24	12·0	7·6
18.	0·173	0·000	0·086	16·1	6·7

Remarks.—This coal is apparently even more friable than the samples from Coal Creek, but in general is very similar to them, the pure coal being much weaker than the ash-bearing material.

TABLE C.

Results of Washing (Details of Sizes).

	Original coal and its products.	Sizes between 1" and ½" Total wt. lbs.	Ash %	Sizes between ½" and ⅛" Total wt. lbs.	Ash %	Sizes under ⅛" Total wt. lbs.	Ash %
19.	Original coal						
20.	Washed coal						
21.	Refuse—coarse						
22.	Hutch product	This sample was not washed					
23.	Jig slimes						
24.	Table slimes						

TABLE D.

Results of Washing (Totals).

25.	Original coal			
26.	Washed coal	wt. in lbs.	% ash	% sulphur
27.	Refuse	" "	" "	" "
28.	Other products	" "	" "	" "
29.	Loss	" "	" "	" "
30.	Loss in %	" "	" "	" "

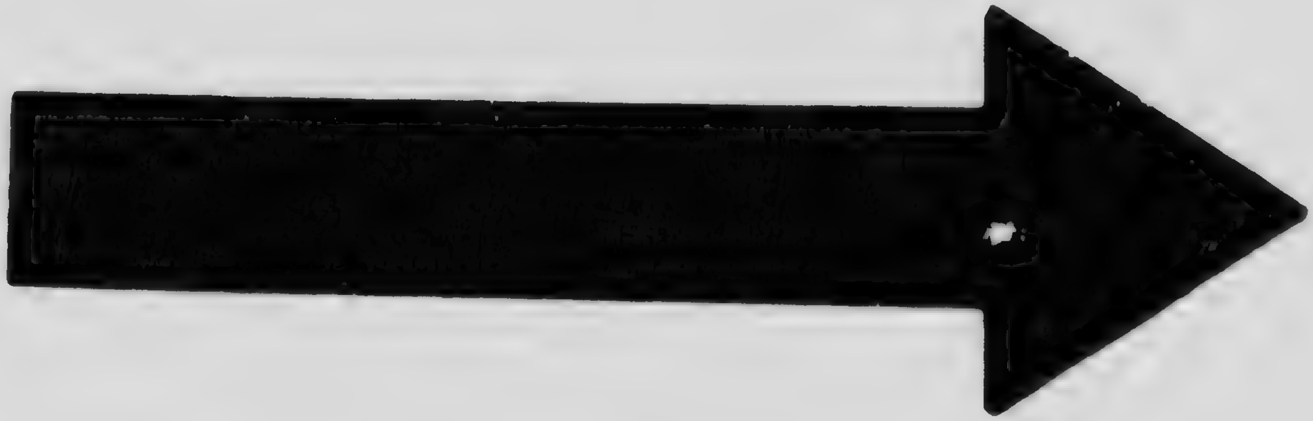
TABLE E.

Summary Statement of Effect of Washing on Fuel Values.

31.	Recovery of washed coal, including good bone.	%	Ratio to standard
32.	Reduction in ash	%	" "
33.	" " sulphur	%	" "
34.	Increase in calorific value—calorimeter	%	
35.	Increase in evaporation under boiler	%	
36.	Decrease in clinker under boiler	%	
37.	Fuel ratio of original coal		
38.	" " washed "		
39.	Calorific value of original coal		
40.	" " washed "		

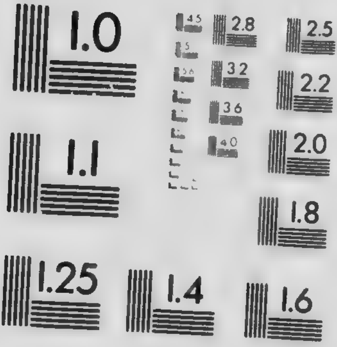
Remarks on Tables C, D, and E.—The results of preliminary tests were such that it was not considered necessary to wash this coal.

AVERAGE DIAMETER IN MM AS GRADED BY SCREEN ANALYSIS



MICROCOPY RESOLUTION TEST CHART

(ANSI and ISO TEST CHART No. 2)



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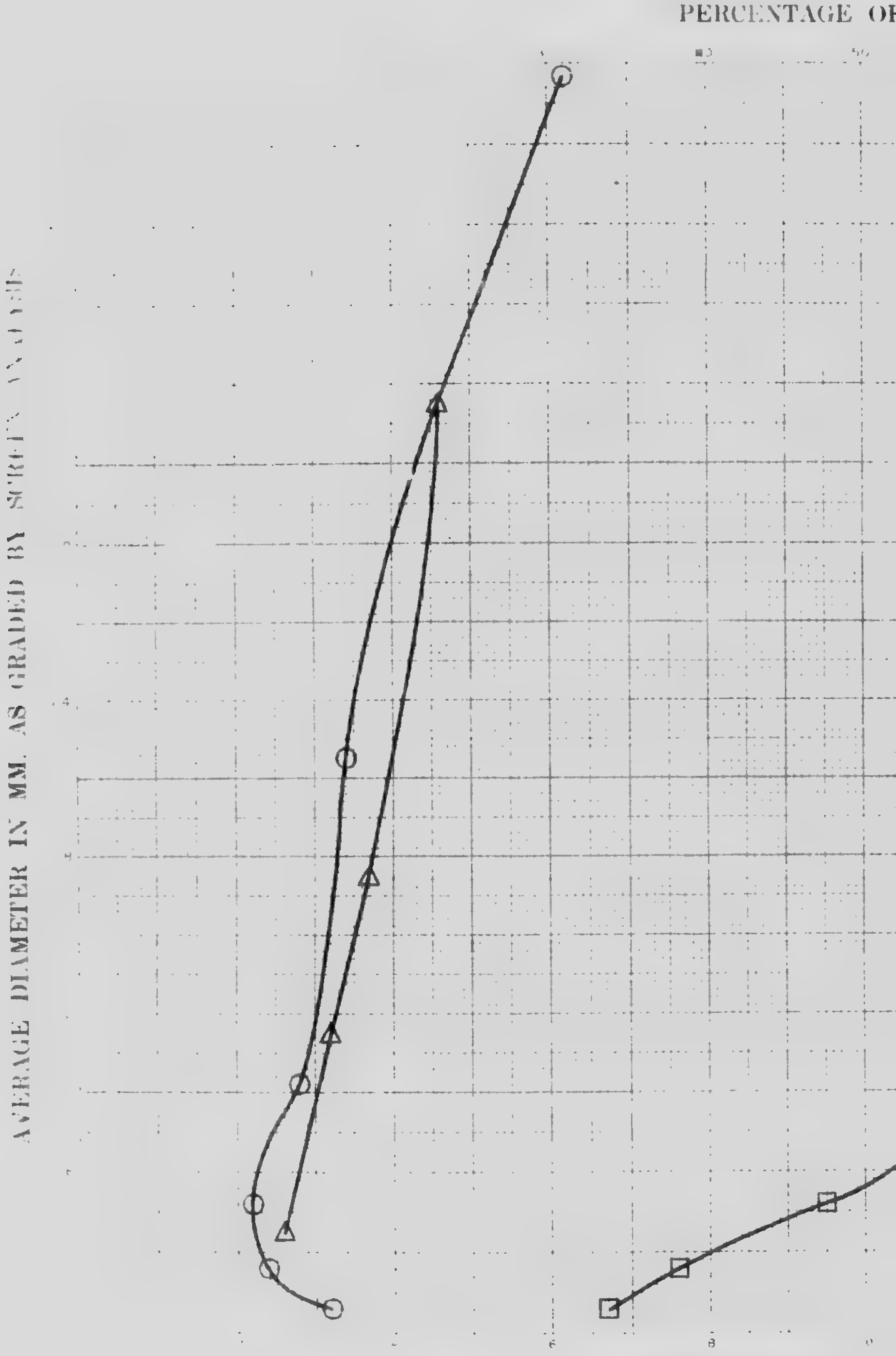
GRAPHIC RECORD OF SIZIN

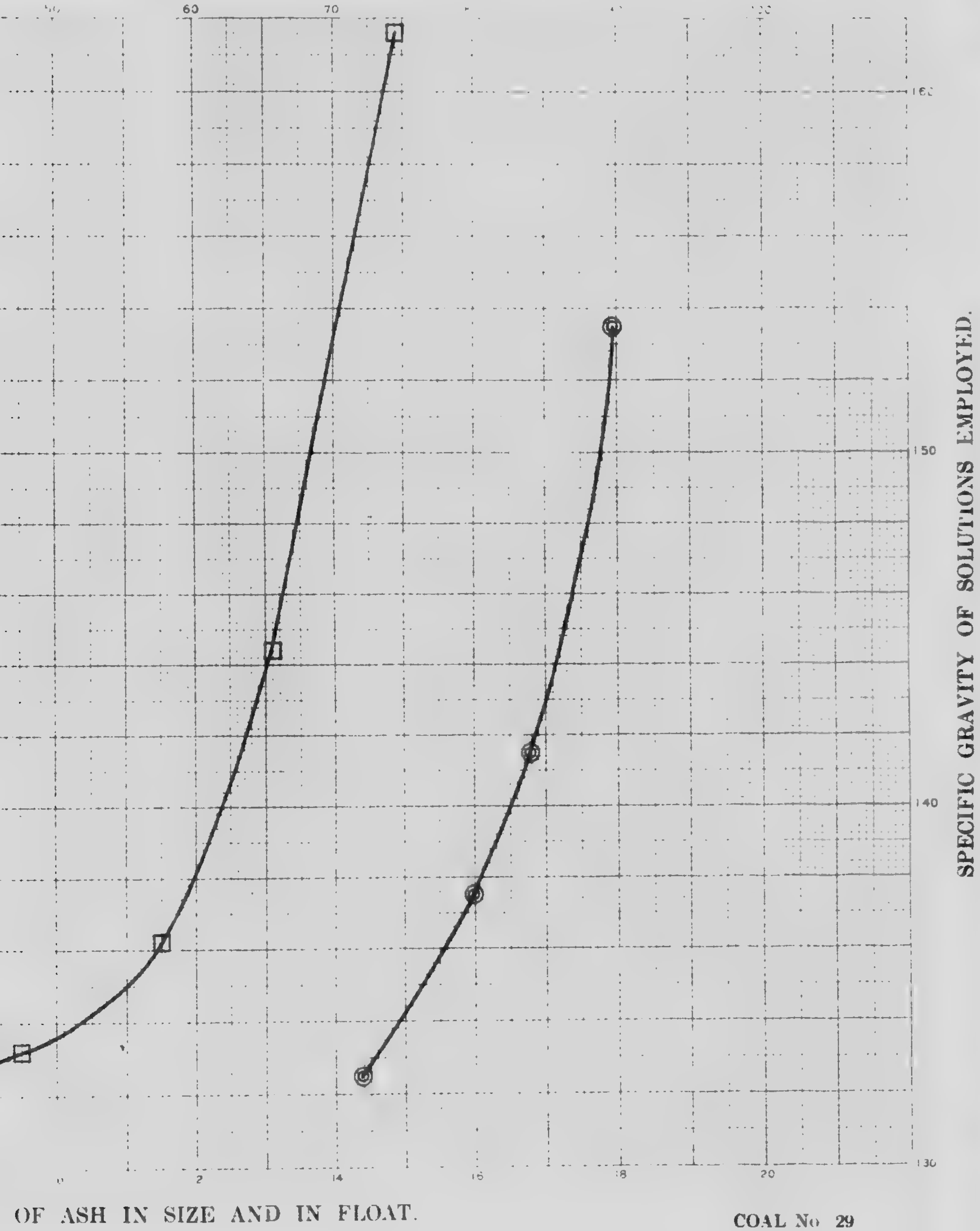


LEGEND: SYMBOLS.

Curve showing the relative quantities of the several sizes.
" " " " " " " " densities.
" " " percentage of ash in each of the several sizes.
○ " " " " " " " material floating at the severa

SIZING AND SPECIFIC GRAVITY TESTS.

AGE OF SIZE AND OF FLOAT.



COAL No 29
Appendix I, Vol. III

s.
sizes.
the several densities

COAL.

Locality.—Hosmer, B.C.

Colliery.—Hosmer Mines, Ltd., Hosmer mine, No. 2 seam.

Sample.—Forty-five bags from No. 2 seam, 1,600 feet in on main crosscut and 740 feet to the south. Coal was run of mine without any cleaning at mine. Lumps of slate over 1½″ were, however, removed by hand before preparing the sample for the laboratory tests. Sampled July 24, 1909.

TABLE A.

Specific Gravity Tests.

	Specific gravity of solution.	Float %	Ash in Float %	Sink %	Ash in Sink %
1.	1·554	86·0	8·4	14·0	54·7
2.	1·440	67·3	6·6	32·7	35·5
3.	1·378	55·8	4·6	44·2	29·5
4.	1·340	31·9	3·5	68·1	22·6

The following results are obtained from the above data, and from the chemists results :—

5.	Good coal, Sp. Gr. under 1·375	% yield	55·0	% ash	4·5
6.	Bone coal, Sp. Gr. 1·375 to 1·55	" "	30·3	" "	15·1
7.	Useful coal—sum of (5) and (6)	" "	85·3	" "	8·3
8.	Refuse, Sp. Gr. over 1·55	" "	14·7	" "	58·6
9.	Assay of original sample raw coal as sent to chemist			" "	15·3
10.	" " " " " "			% sulphur	0·3
11.	" " " " " "			Fuel Ratio	2 90
12.	Assay of mixed good and bone coal (5) and (6).			" "	

Remarks.—This sample should be compared with samples 52 and 53, which were taken at the same time from seams higher in the measures, but with more cover. As the depth increases the proportions of both good and useful coal increase and the ash decreases, while the refuse which is high in 51 becomes quite low in 53.

All of these coals can be improved by washing, but as the workings get deeper it is probable that washing will be unnecessary, unless for the manufacture of high grade coke.

TABLE B.

Screen Analysis.

	Maximum Screen MM.	Minimum Screen MM.	Mean MM.	% of whole sample.	% Ash in size.
13.					
14.					
15.					
16.					
17.					
18.					

Remarks on Table B—No screen analyses were made on this coal.

TABLE C.

Results of Washing (Details of Sizes).

Original coal and its products.	Sizes between 1" and ½" Total wt. lbs.	Ash. %	Sizes between ½" and ¼" Total wt. lbs.	Ash. %	Sizes under ¼" Total wt. lbs.	Ash. %
19. Original coal						
20. Washed coal						
21. Refuse—coarse.						
22. Hutch product. } Not washed						
23. Jig slimes						
24. Table slimes						

TABLE D.

Results of Washing (Totals).

25. Original coal .... wt. in lbs. .... % ash .... % sulphur ..
26. Washed coal .... " " .... " " .... " " ..
27. Refuse .... " " .... " " .... " " ..
28. Other products .... " " .... " " .... " " ..
29. Loss .... " " .... " " .... " " ..
30. Loss in % .....

TABLE E.

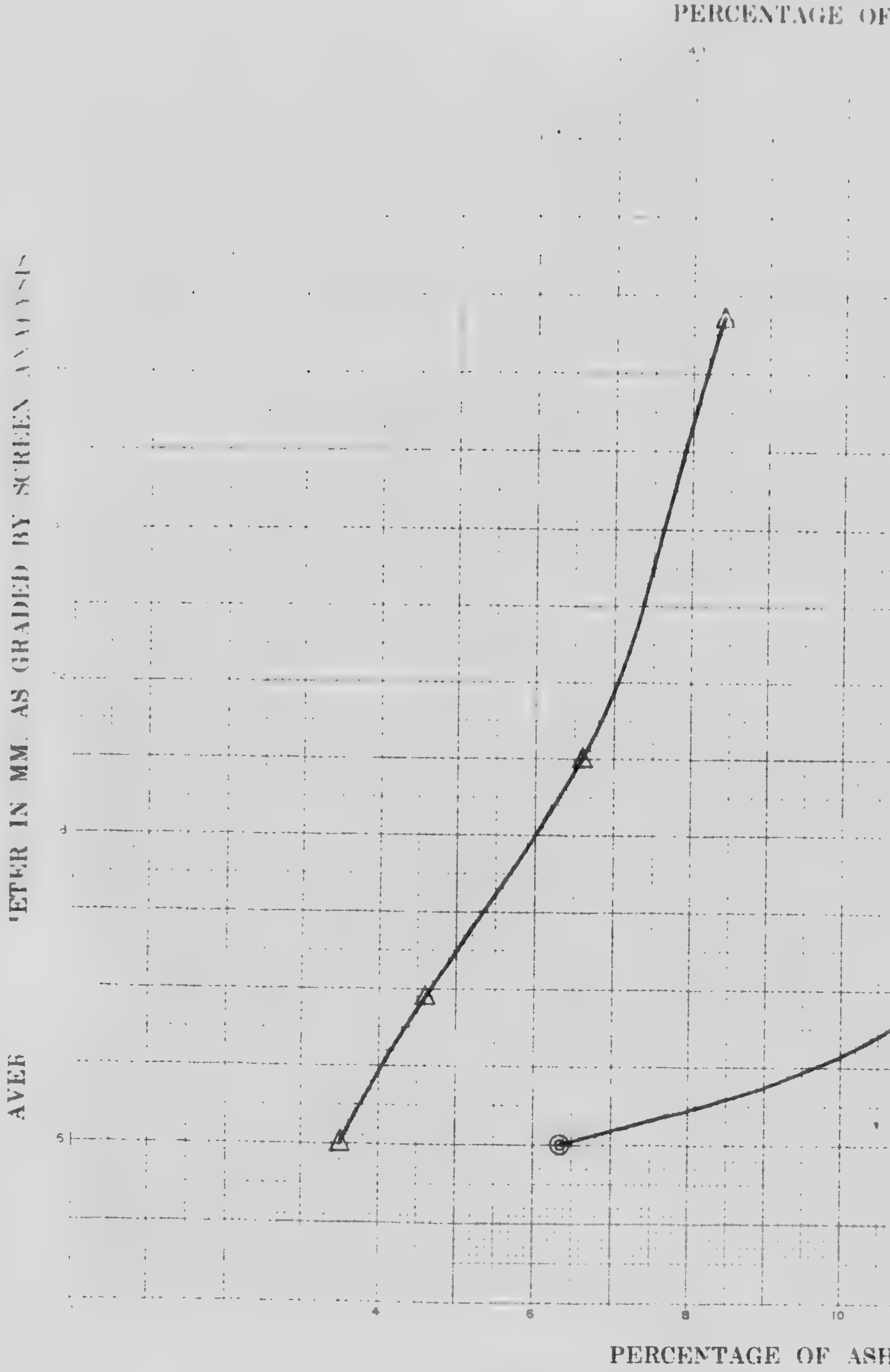
Summary Statement of Effect of Washing on Fuel Values.

31. Recovery of washed coal, including good bone .. % .... Ratio to standard ..
32. Reduction in ash .... % .. " " ..
33. " " sulphur .... % .. " " ..
34. Increase in calorific value—calorimeter %
35. Increase in evaporation under boiler ... %
36. Decrease in clinker under boiler .... %
37. Fuel ratio of original coal ....
38. " " washed " ....
39. Calorific value of original coal ....
40. " " washed " ....

Remarks on Tables C, D, and E.—It was not considered necessary to wash this sample.

AVERAGE DIAMETER IN MM. AS GRADED BY SCREEN ANALYSIS

GRAPHIC RECORD OF SIZIN

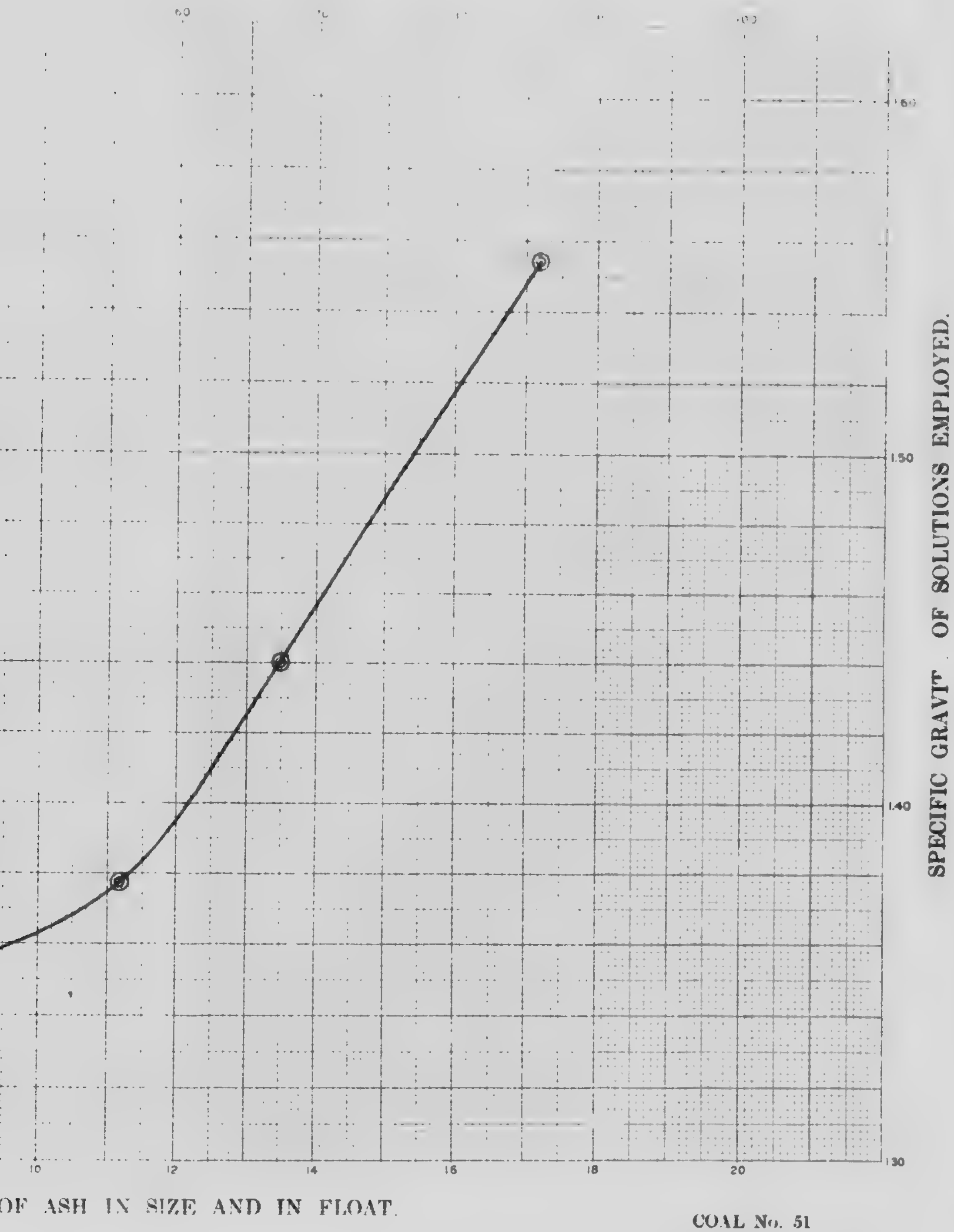


LEGEND: SYMBOLS.

Curve showing the relative quantities of the several sizes.
" " " " " " " " densities.
○ " " " percentage of ash in each of the several sizes.
" " " " material floating at the several

SIZING AND SPECIFIC GRAVITY TESTS.

AGE OF SIZE AND OF FLOAT



COAL No. 51
APPENDIX I, VOL. III

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e several densities.

COAL. No. 52.

Locality.—Hosmer, B.C.

Colliery.—Hosmer Mines, Ltd., Hosmer mine, No. 6 seam.

Sample.—Forty-five bags from No. 6 seam, 3,355 feet in on the main cross-cut and 450 feet to the south.

Coal was run of mine without any cleaning at the mine. Lumps of slate over 1½″ were, however, removed by hand at the laboratory before preparing the sample for the tests. Sampled July, 1909.

TABLE A.

Specific Gravity Tests.

	Specific gravity of solution.	Float %	Ash in Float %	Sink %	Ash in Sink %
1.	1·550	86·2	7·0	13·8	59·9
2.	1·426	79·9	5·5	20·1	43·1
3.	1·375	69·0	4·2	31·0	33·4
4.	1·325	57·1	3·9	42·9	24·3

The following results are obtained from the above data, and from the chemists results :—

5.	Good coal, Sp. Gr. under 1·375	% yield	69·0	% ash	4·2
6.	Bone coal, Sp. Gr. 1·375 to 1·55	" "	17·2	" "	18·2
7.	Useful coal—sum of (5) and (6)	" "	86·2	" "	7·0
8.	Refuse, Sp. Gr. over 1·55	" "	13·8	" "	52·6
9.	Assay of original sample raw coal as sent to chemist			" "	12·4
10.	" " " " " "			% sulphur	0·6
11.	" " " " " "			Fuel Ratio	2·42
12.	Assay of mixed good and bone coal (5) and (6)			" "	

Remarks.—This sample should be compared with samples 51 and 53' which were taken at the same time from other seams. As the depth of cover increases the proportions of both good and useful coal increase and the ash decreases, while the refuse which is high in 51 becomes quite low in 53.

All of these coals can be improved by washing, but as the workings get deeper it is probable that washing will be unnecessary unless for the manufacture of high grade coke.

TABLE B.

Screen Analysis.

	Maximum Screen MM.	Minimum Screen MM.	Mean MM.	[illegible]	% Ash in size
13					
14.					
15					
16					
17					
18					

Remarks on Table B.—No screen analysis was [illegible]

TABLE C

Results of Washing (Details of Sizes).

Original coal and its products.	Sizes between 1" and ½" Total wt. lbs.	Ash. %	Sizes between ½" and ¼" Total wt. lbs.	Ash. %	Sizes under ¼" Total wt. lbs.	Ash. %
19. Original coal						
20. Washed coal						
21. Refuse—coarse						
22. Hutch product	Not washed					
23. Jig slimes						
24. Table slimes						

TABLE D

Results of Washing (Totals).

	wt. in lbs.	% ash	% sulphur
25. Original coal			
26. Washed coal.	" "	" "	" "
27. Refuse	" "	" "	" "
28. Other products	" "	" "	" "
29. Loss	" "	" "	" "
30. Loss in %	" "	" "	" "

TABLE E

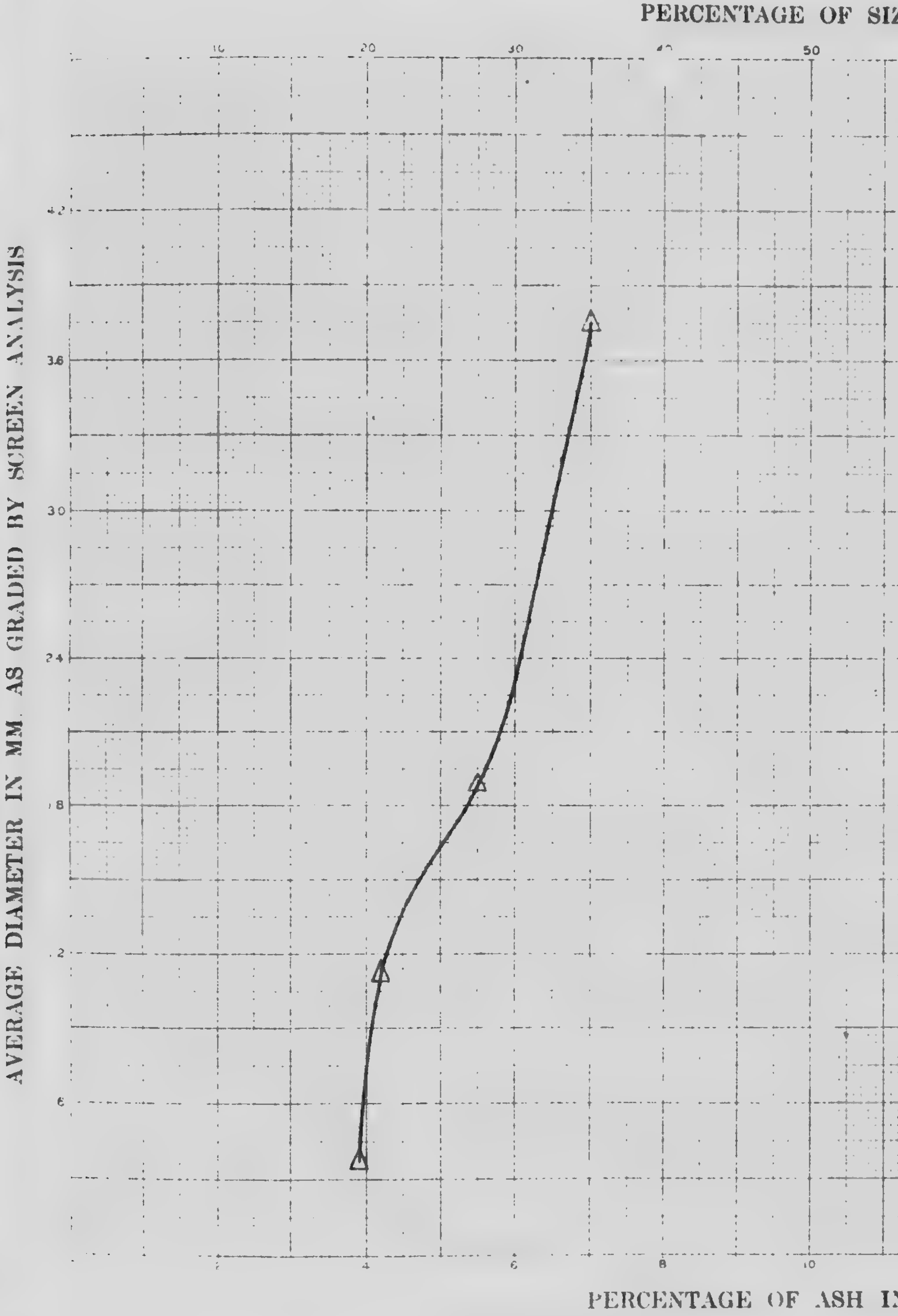
Summary Statement of Effect of Washing on Fuel Values.

31.	Recovery of washed coal, including good bone	%	Ratio to standard
32.	Reduction in ash	%	" "
33.	" " sulphur	%	" "
34.	Increase in calorific value—calorimeter	%	
35.	Increase in evaporation under boiler	%	
36.	Decrease in clinker under boiler	%	
37.	Fuel ratio of original coal		
38.	" " washed "		
39.	Calorific value of original coal		
40.	" " washed "		

Remarks on Tables C, D, and E.—It was not considered necessary to wash this sample.

AVERAGE DIAMETER IN MM AS GRADED BY SCREEN ANALYSIS

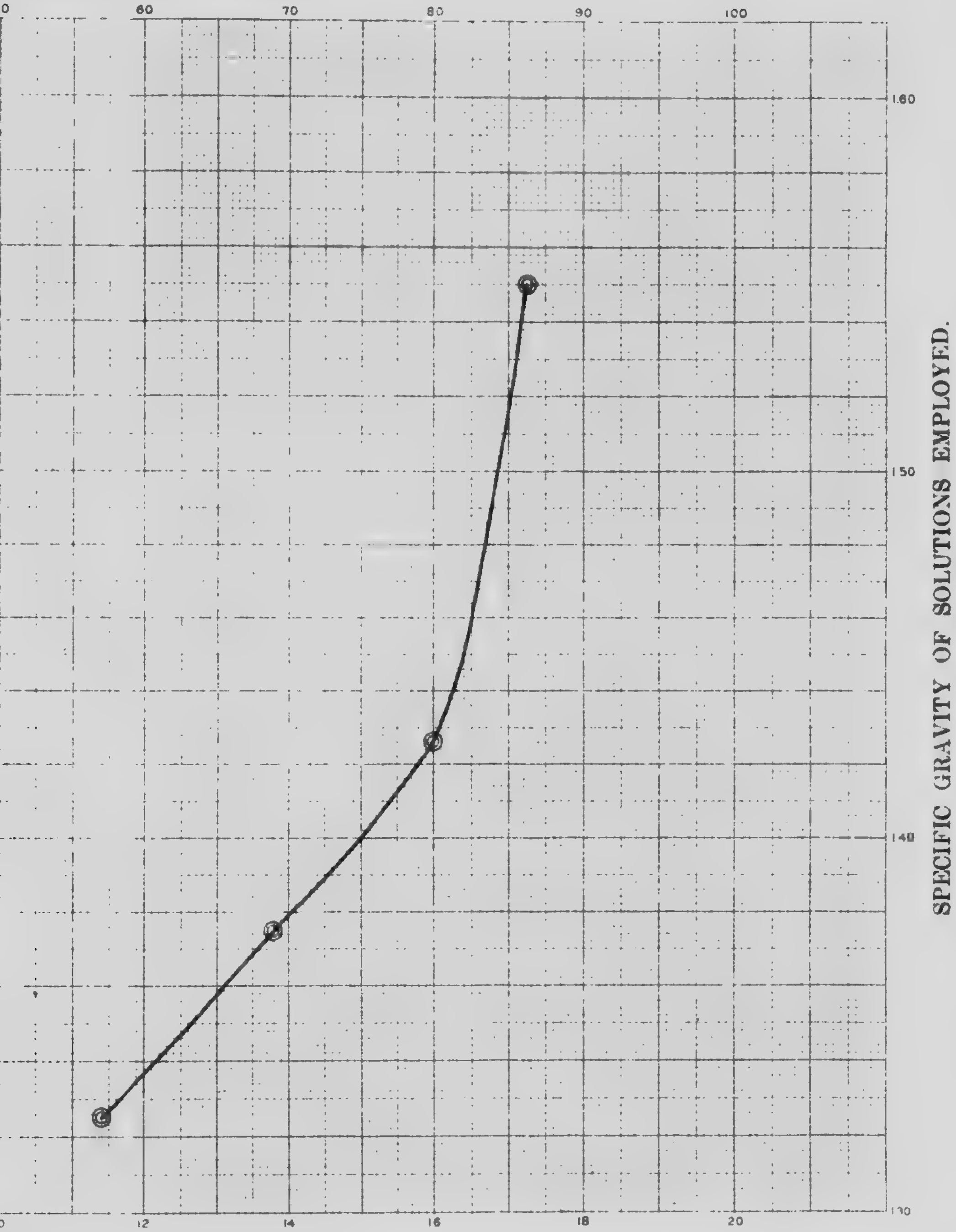
GRAPHIC RECORD OF SIZING A



LEGEND: SYMBOLS.
△ Curve showing the relative quantities of the several sizes
" " " " " " " " densities.
" " " percentage of ash in each of the several sizes.
◎ " " " " " " " material floating at the several dens

NG AND SPECIFIC GRAVITY TESTS.

OF SIZE AND OF FLOAT.



ASH IN SIZE AND IN FLOAT.

COAL No. 52
APPENDIX I, VOL. III

veral densities.

COAL.—No. 53.

Locality.—Hosmer, B.C.

Colliery.—Hosmer Mines, Ltd., Hosmer mine, No. 8 seam.*

*At the time this sample was taken the No. 8 was the deepest seam, and the highest stratigraphically that had been developed sufficiently to sample. Since then the No. 9 seam has been opened and has proved to be of better quality than any of the three sampled.

Sample.—Ten bags from No. 8 seam, 3.790 feet in on main cross-cut 85 feet to the south.

Coal was run of mine without any cleaning at mine. Lumps of slate over 1½″ were, however, removed by hand before preparing the sample for the laboratory tests. Sampled July 24, 1909.

TABLE A

Specific Gravity Tests.

	Specific gravity of solution.	Float %	Ash in Float %	Sink %	Ash in Sink %
1.	1·554	93·6	3·9	6·4	56·2
2.	1·421	90·8	3·3	9·2	46·6
3.	1·375	87·9	2·9	12·1	37·2
4.	1·325	81·7	2·7	18·3	28·3

The following results are obtained from the above data, and from the chemists results :—

5.	Good coal, Sp. Gr. under 1·375	% yield	87·9	% ash	2·9
6.	Bone coal, Sp. Gr. 1·375 to 1·55	" "	5·7	" "	19·3
7.	Useful coal—sum of (5) and (6)	" "	93·6	" "	3·9
8.	Refuse, Sp. Gr. over 1·55	" "	6·4	" "	55·5
9.	Assay of original sample raw coal as sent to chemist			" "	7·5
10.	" " " " " "			% sulphur	0·6
11.	" " " " " "			Fuel Ratio	2·30
12.	Assay of mixed good and bone coal (5) and (6)			" "	....

Remarks.—This sample should be compared with samples 51 and 52, which were taken at the same time from seams lower in the measures but with less cover. As the depth of cover increases the proportions of both good and useful coal increase and the ash decreases, while the refuse, which is high in 51, becomes quite low in 53.

All these coals can be improved by washing, but as the workings get deeper it is probable that washing will be unnecessary, unless for the manufacture of high grade coke.

TABLE B.

Screen Analysis.

	Maximum Screen MM.	Minimum Screen MM.	Mean MM.	% of whole sample.	% Ash in size.
13.	...	....	.		
14.					
15.					.
16.					
17.					.
18.					

Remarks on Table B.—No screen analysis was made on this coal.

TABLE C.

Results of Washing (Details of Sizes).

Original coal and its products.	Sizes between 1" and ½" Total wt. lbs.	Ash. %	Sizes between ½" and ⅛" Total wt. lbs.	Ash. %	Sizes under ⅛" Total wt. lbs.	Ash. %
19. Original coal....	Not washed.					
20. Washed coal....						
21. Refuse—coarse..						
22. Hutch product..						
23. Jig slimes						
24. Table slimes....						

TABLE D.

Results of Washing (Totals).

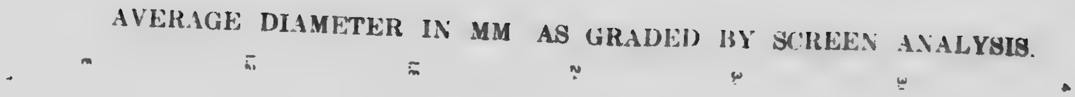
25. Original coal........................	wt. in lbs.	% ash	% sulphur ...
26. Washed coal........................	" "	" "	" " ....
27. Refuse...............................	" "	" "	" " ....
28. Other products.....................	" "	" "	" " ....
29. Loss..................................	" "	" "	" " ....
30. Loss in %			

TABLE E.

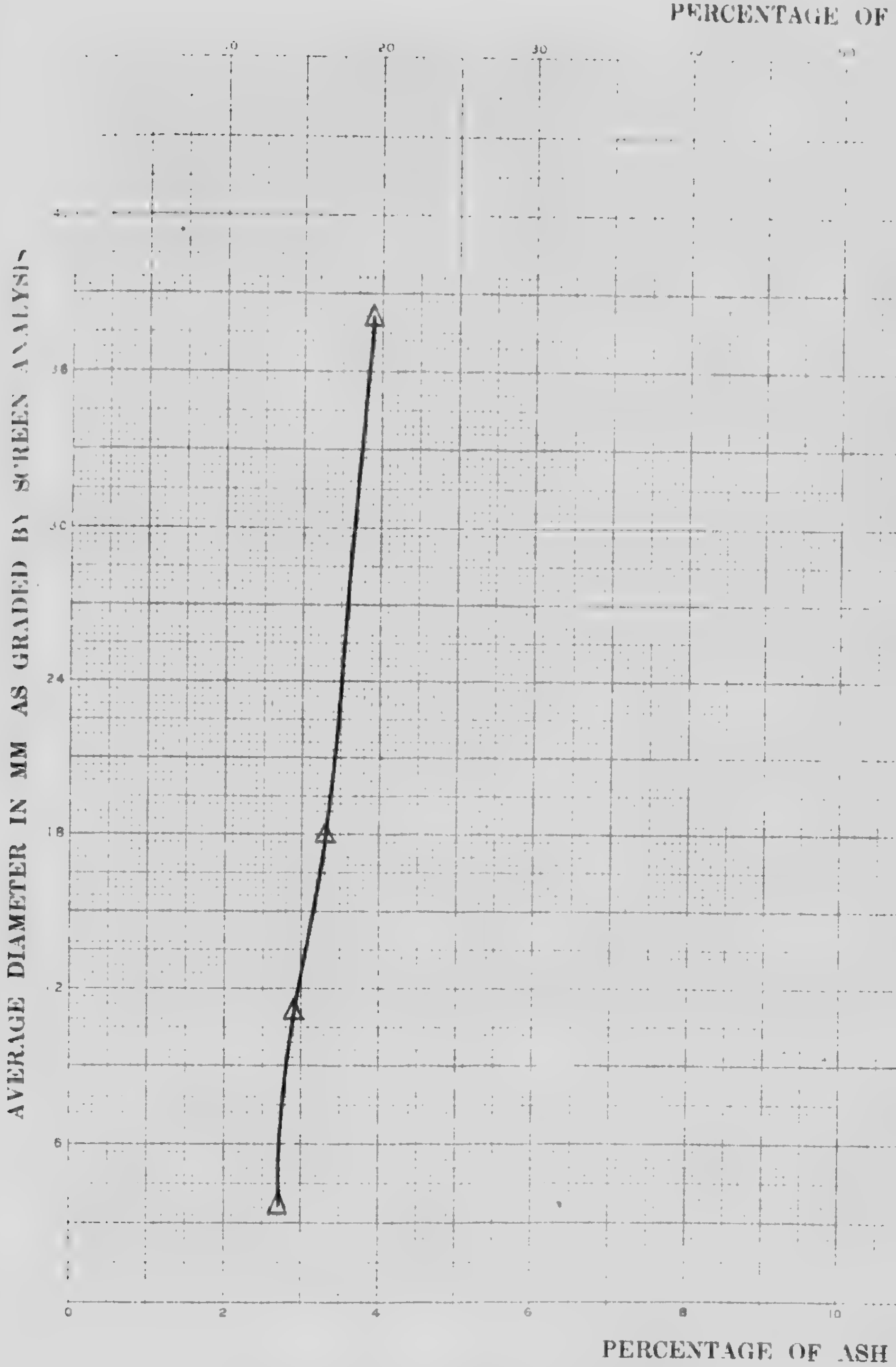
Summary Statement of Effect of Washing on Fuel Values.

31. Recovery of washed coal, including good bone..	%	Ratio to standard ..
32. Reduction in ash........................	%	" " ..
33. " " sulphur........................	%	" " ..
34. Increase in calorific value—calorimeter........	%	
35. Increase in evaporation under boiler........	%	
36. Decrease in clinker under boiler	%	
37. Fuel ratio of original coal...		
38. " " washed "		
39. Calorific value of original coal		
40. " " washed "		

Remarks on Tables C, D, and E.—It was not considered necessary to wash this coal.


AVERAGE DIAMETER IN MM AS GRADED BY SCREEN ANALYSIS.
6
1.2
1.8
2.4
3.0
3.6
4

GRAPHIC RECORD OF SIZING

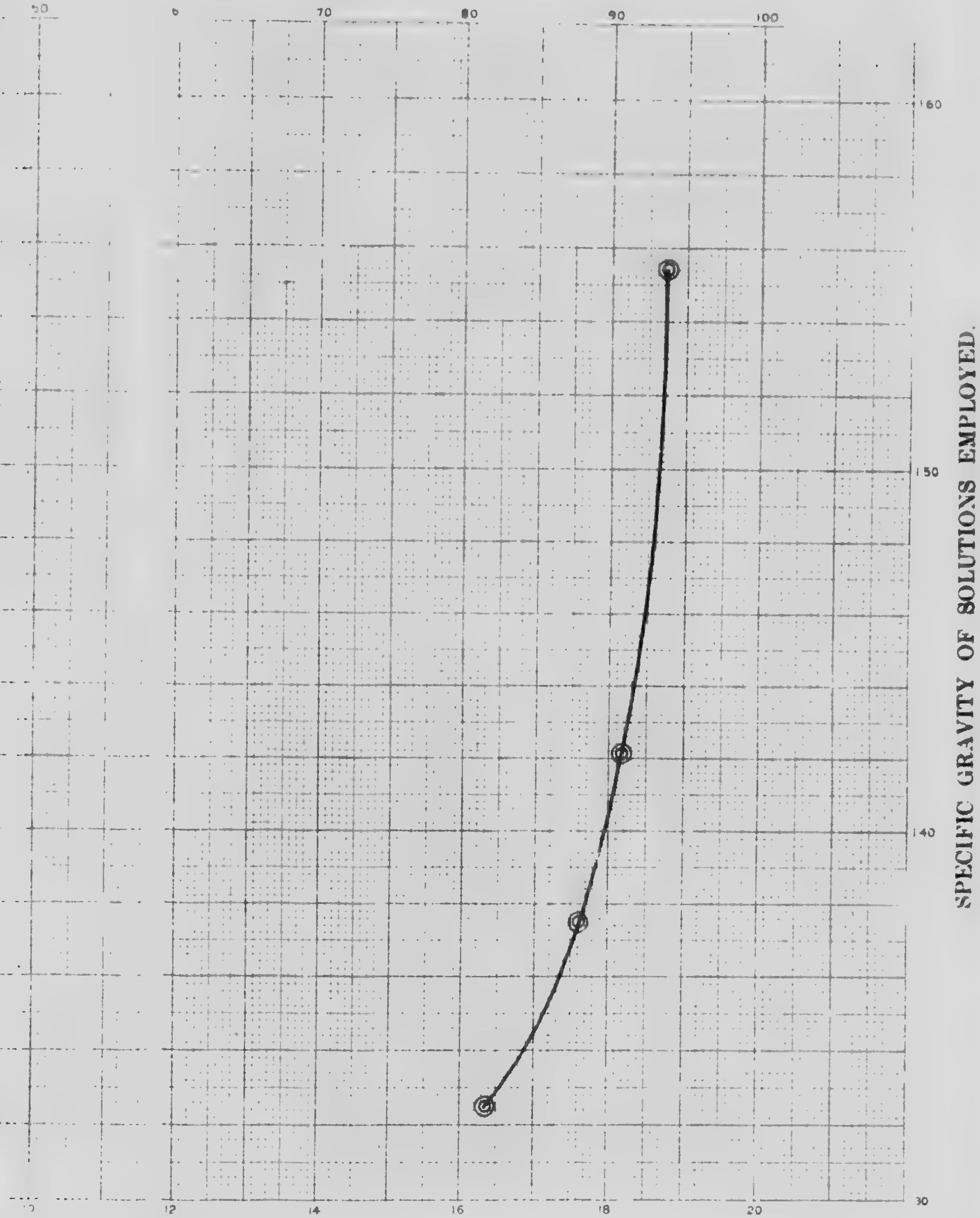


LEGEND: SYMBOLS.

○ **Curve** showing the relative quantities of the several sizes.
△ " " " " " " " " densities.
⌉ " " " percentage of ash in each of the several sizes.
◎ " " " " " " " material floating at the several d

IZING AND SPECIFIC GRAVITY TESTS.

GE OF SIZE AND OF FLOAT.



F ASH IN SIZE AND IN FLOAT.

COAL No. 53
APPENDIX I, VOL. III

s.
several densities.

COAL.—No. 27.

Locality.—Coal Creek, Fernie, B.C.

Colliery.—Crowsnest Pass Coal Co., Coal Creek. No. 2 mine

Sample.—One hundred and forty-four bags of commercial screened coal from the No. 5 mine, on the north side of Coal creek. The coal was first screened on a 2″ shaking screen and then hand picked. Sampled April 25, 1908.

TABLE A.

Specific Gravity Tests.

	Specific gravity of solution.	Float %	Ash in Float %	Sink %	Ash in Sink %
1.	1·510	87·9	3·3	12·1	53·2
2.	1·430	85·6	2·[illegible]	14·4	46·8
3.	1·370	83·2	2·4	16·8	42·0
4.	1·320	80·2	2·2	19·8	36·1

The following results are obtained from the above data, and from the chemists results :—

5.	Good coal, Sp. Gr. under 1·375	% yield	85·5 %	ash	2·4
6	Bone coal, Sp. Gr., 1·375 to 1·55	" "	5·5 "	"	21·1
7.	Useful coal—sum of (5) and (6)	" "	89·0 "	"	3·6
8.	Refuse, Sp. Gr. over 1·55	" "	11·0 "	"	56·0
9.	Assay of original sample raw coal as sent to chemist			" "	9·0
10.	" " " " " "			% sulphur	0·5
11.	" " " " " "			Fuel Ratio	2·46
12.	Assay of mixed good and bone coal (5) and (6)			" "	2·93

Remarks.—The coal is low in innate ash, and contains but little bone, although the latter is high in ash. There is a fairly large amount of refuse, with a medium proportion of ash. The coal could, therefore, be decidedly improved by washing if the circumstances justify it, but under present conditions this treatment is unnecessary, unless for high grade coke. The coal is on the whole one of the best in the whole series.

TABLE B.

Screen Analysis.

	Maximum Screen MM.	Minimum Screen MM.	Mean MM.	% of whole sample	% Ash in size.
13.	6·34	3·16	4·75	38·1	15·5
14.	3·16	1·20	2·18	15·8	8·9
15.	1·20	0·64	0·92	14·7	7·4
16.	0·64	0·30	0·47	10·7	7·0
17.	0·30	0·173	0·24	10·4	5·7
18.	0·173	0·000	0·086	10·3	7·6

Remarks.—The coal makes a large proportion of fines, which are comparatively low in ash. It is evident, therefore, that the pure coal is very much more friable than the ash-bearing material.

TABLE C.

Results of Washing (Details of Sizes).

	Original coal and its products.	Sizes between 1" and ½" Total wt. lbs.	Ash. %	Sizes between ½" and ⅛" Total wt. lbs.	Ash. %	Sizes under ⅛" Total wt. lbs.	Ash. %
19.	Original coal						
20.	Washed coal						
21.	Refuse—coarse						
22.	Hutch product	This coal was not washed.					
23.	Jig slimes						
24.	Table slimes						

TABLE D.

Results of Washing (Totals).

25.	Original coal			
26.	Washed coal	wt. in lbs.	% ash	% sulphur
27.	Refuse	" "	" "	" "
28.	Other products	" "	" "	" "
29.	Loss	" "	" "	" "
30.	Loss in %	" "	" "	" "

TABLE E.

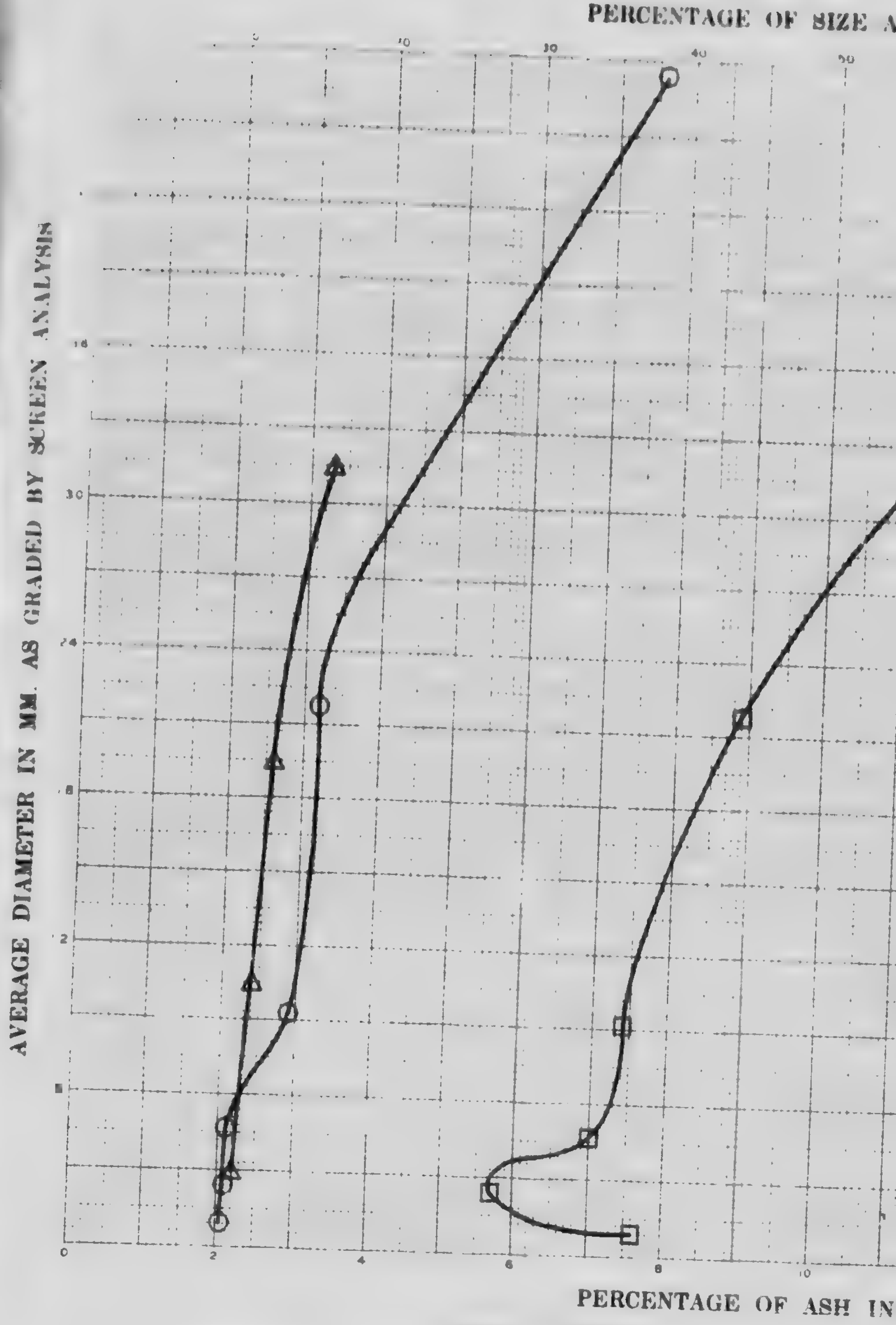
Summary Statement of Effect of Washing on Fuel Values.

31.	Recovery of washed coal, including good bone....%	....	
32.	Reduction in ash.......................%	....	Ratio to standard ....
33.	" " sulphur.......................%	....	" " ....
34.	Increase in calorific value—calorimeter......%	....	" " ....
35.	Increase in evaporation under boiler ......%	....	
36.	Decrease in clinker under boiler.............%	....	
37.	Fuel ratio of original coal.....................%	....	
38.	" " washed "	....	
39.	Calorific value of original coal..................	....	
40.	" " washed "	....	

Remarks on Tables C, D, and E.—The results of preliminary tests were such that it was not considered necessary to wash this coal.

AVERAGE DIAMETER IN MM. AS GRADED BY SCREEN ANALYSIS.

GRAPHIC RECORD OF SIZING

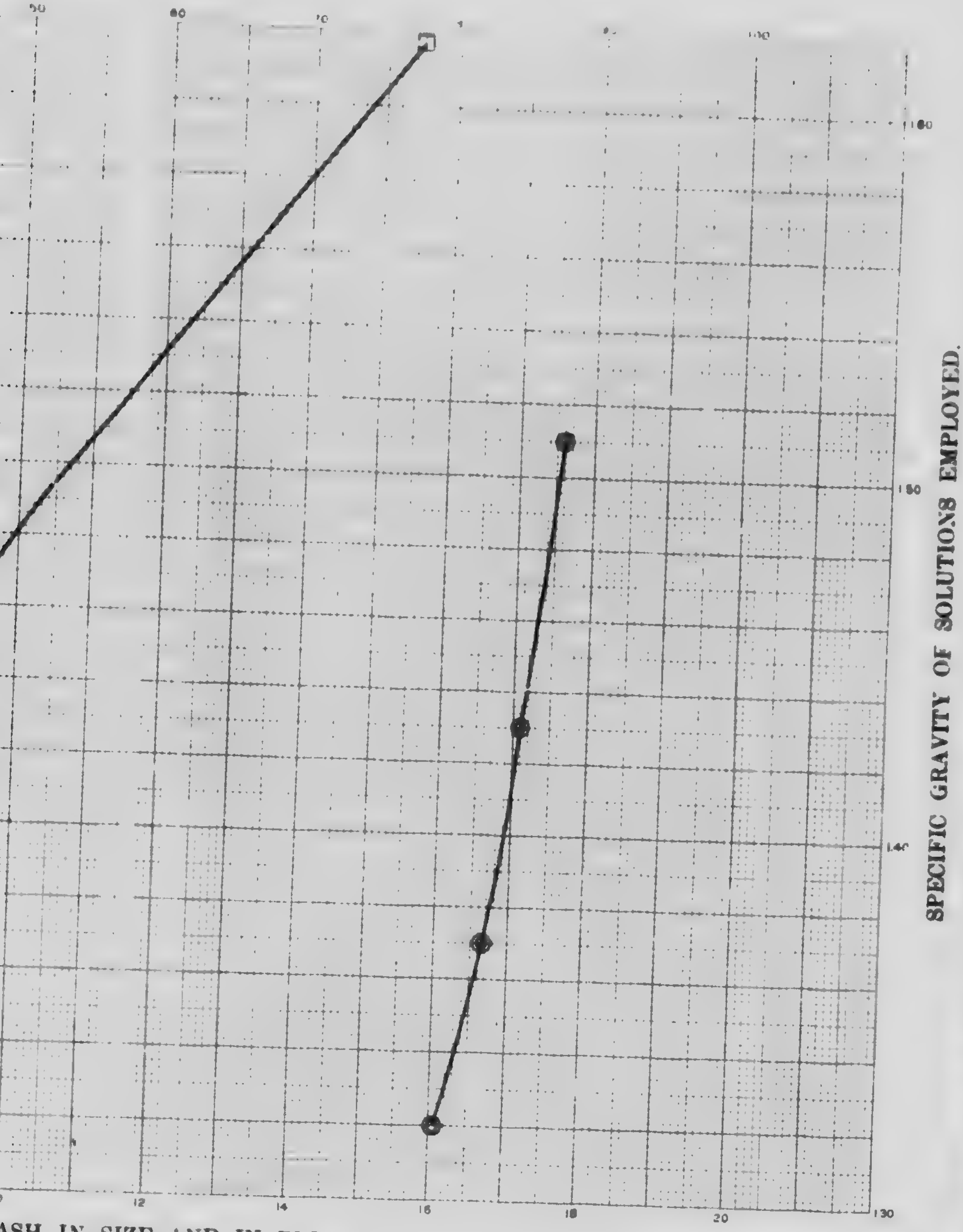


LEGEND: SYMBOLS.

○ Curve showing the relative quantities of the several sizes.
△ " " " " " " " densities.
□ " " " percentage of ash in each of the several sizes.
● " " " " " " " material floating at the several densit

IZING AND SPECIFIC GRAVITY TESTS

SIZE AND OF FLOAT



ASH IN SIZE AND IN FLOAT.

COAL No. 27
APPENDIX I, VOL. III

eral densities.

COAL.—No. 26.

Locality.—Coal Creek, Fernie, B.C.

Colliery.—Crowsnest Pass Coal Co., No. 5 Coal Creek mine.

Sample.—One hundred and fifty-one sacks of commercial screened coal from the No. 5 mine, on the north side of Coal creek. The coal was first screened on a 2″ shaking screen and then hand picked. Sampled April 25, 1908.

TABLE A.

Specific Gravity Tests.

	Specific gravity of solution.	Float %	Ash in Float %	Sink %	Ash in Sink %
1.	1·555	93·0	6·2	7·0	69·1
2.	1·410	88·3	5·1	11·7	50·6
3.	1·375	84·7	4·6	13·3	41·1
4.	1·335	75·8	3·1	24·2	33·6

The following results are obtained from the above data, and from the chemists results:—

5.	Good coal, Sp. Gr. under 1·375	% yield	84·7	% ash	4·6
6.	Bone coal, Sp. Gr. 1·375 to 1·55	" "	8·3	" "	23·2
7.	Useful coal—sum of (5) and (6)	" "	93·0	" "	6·2
8.	Refuse, Sp. Gr. over 1·55	" "	7·0	" "	69·0
9.	Assay of original sample raw coal as sent to chemist			" "	10·8
10.	" " " " " "			% sulphur	0·5
11.	" " " " " "			Fuel Ratio	2·72
12.	Assay of mixed good and bone coal (5) and (6)			" "	2·69

Remarks.—This coal has a medium proportion of innate ash and rather small proportions of bone and refuse, both high in ash. A considerable reduction in ash could be made by washing, but the original coal is good enough for present purpose, and, therefore, washing is not justifiable, except for high grade coke.

TABLE B.

Results of Washing (Details of Sizes).

	Maximum Screen MM.	Minimum Screen MM.	Mean MM.	% of whole sample	% Ash in size.
13.	6·34	3·16	4·75	40·2	16·5
14.	3·16	1·20	2·18	13·8	11·7
15.	1·20	0·64	0·92	12·2	10·0
16.	0·64	0·30	0·47	9·3	9·0
17.	0·30	0·173	0·24	10·9	7·6
18.	0·173	0·000	0·086	13·6	7·4

Remarks.—The proportion of fines is very large, and the low ash in the fine sizes indicates that the coal is much more friable than its ash-bearing material. The amount of ash in the coarser lumps is surprisingly high, in comparison with the analysis of the whole sample.

TABLE C.

Results of Washing (Details of Sizes).

	Original coal and its products.	Sizes between 1″ and ½″ Total wt. lbs.	Ash. %	Sizes between ½″ and ⅛″ Total wt. lbs.	Ash. %	Sizes under ⅛″ Total wt. lbs.	Ash. %
19.	Original coal	This coal was not washed.					
20.	Washed coal.						
21.	Refuse—coarse						
22.	Hutch product						
23.	Jig slimes.						
24.	Table slimes.						

TABLE D.

Results of Washing (Totals).

25.	Original coal			
26.	Washed coal	wt. in lbs.	% ash	% sulphur
27.	Refuse	" "	" "	" "
28.	Other products	" "	" "	" "
29.	Loss	" "	" "	" "
30.	Loss in %	" "	" "	" "

TABLE E.

Summary Statement of Effect of Washing on Fuel Values.

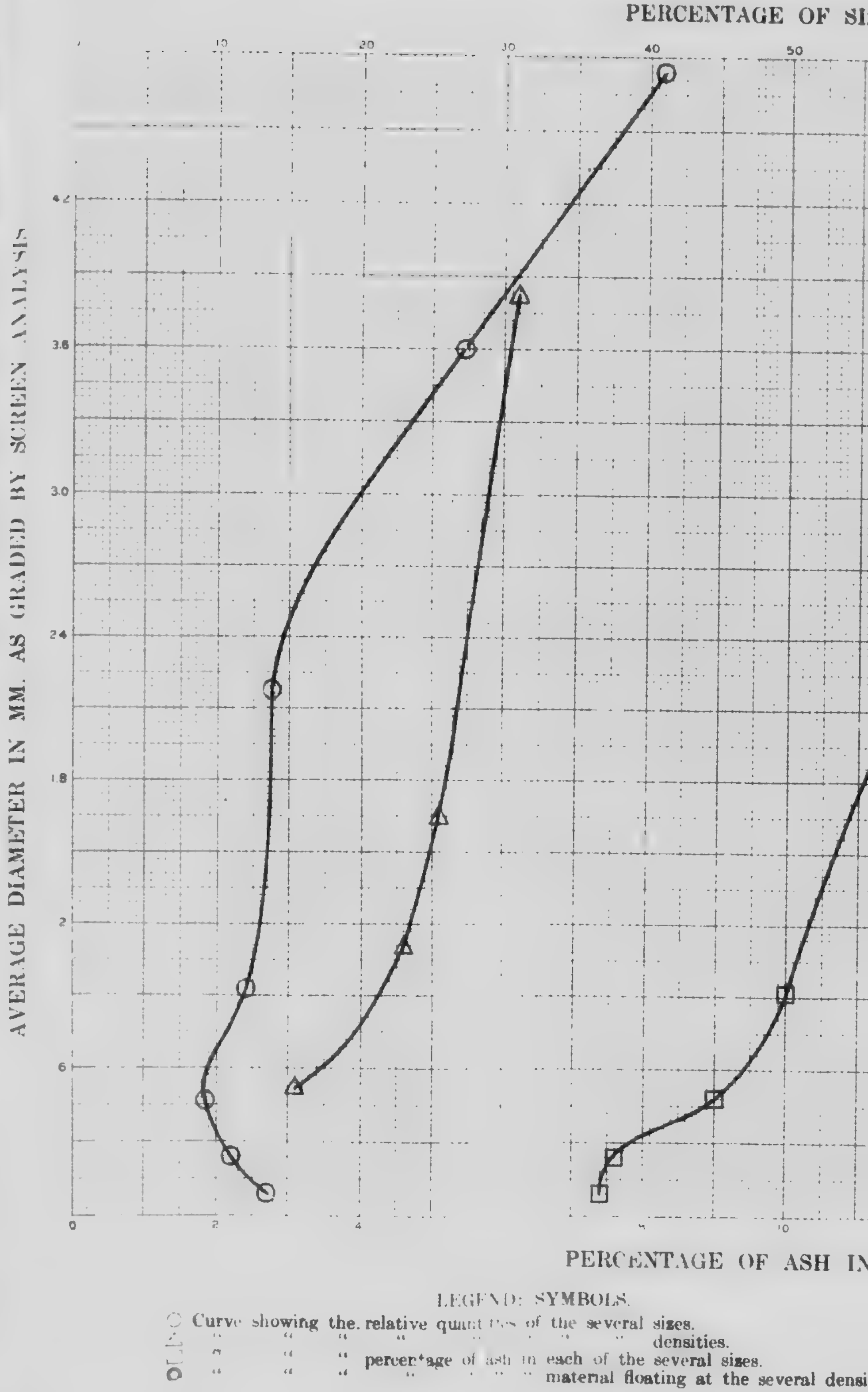
31.	Recovery of washed coal, including good bone	%	
32.	Reduction in ash	%	Ratio to standard
33.	" " sulphur	%	" "
34.	Increase in calorific value—calorimeter	%	" "
35.	Increase in evaporation under boiler	%	
36.	Decrease in clinker under boiler	%	
37.	Fuel ratio of original coal		
38.	" " washed "		
39.	Calorific value o. original coal		
40.	" " washed "		

Remarks on Tables C, D, and E.—The results of preliminary tests were such that it was not considered necessary to wash this coal.

AVERAGE DIAMETER IN MM. AS GRADED BY SCREEN ANALYSIS

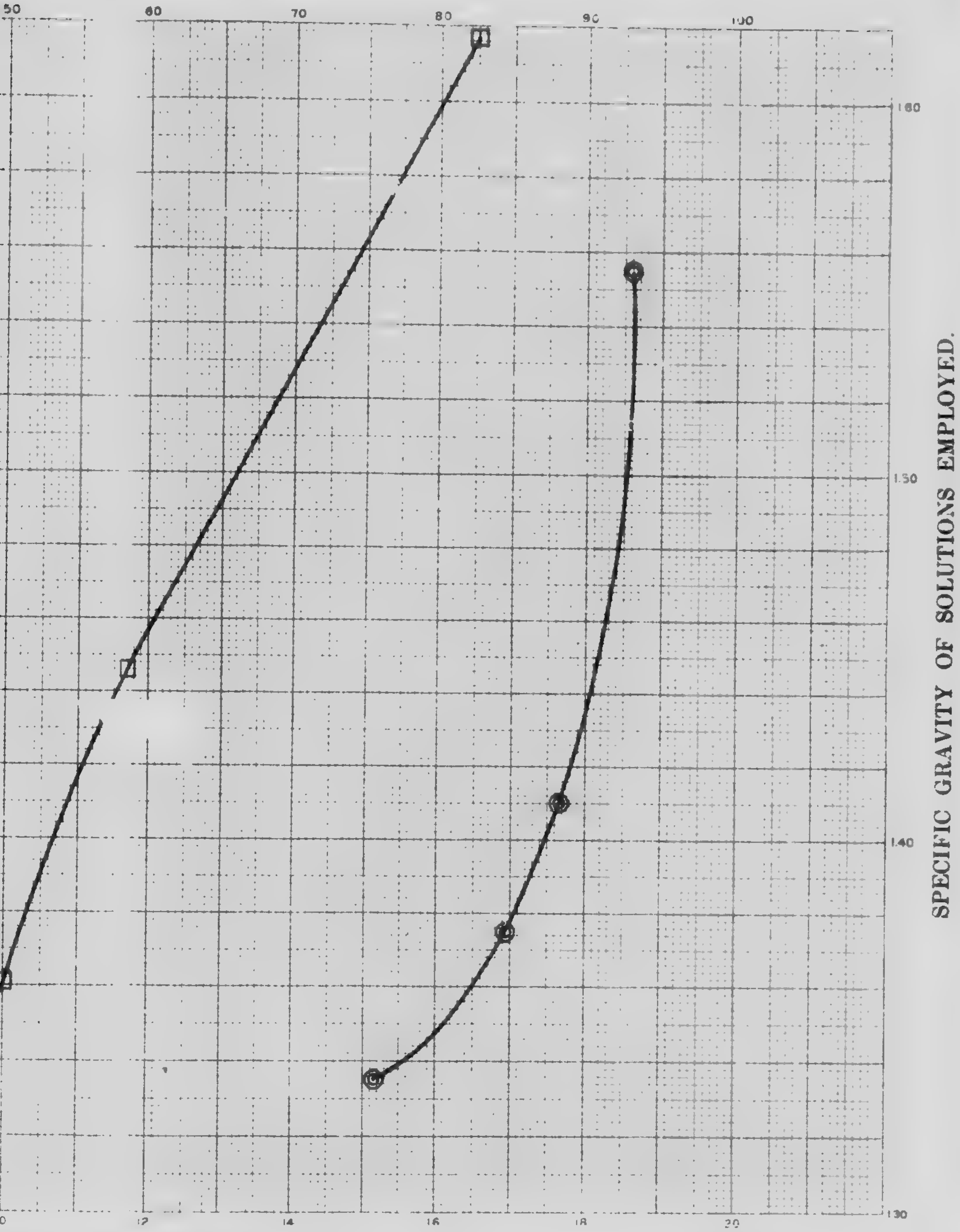
2 3 3 4

GRAPHIC RECORD OF SIZING A



ING AND SPECIFIC GRAVITY TESTS.

OF SIZE AND OF FLOAT



ASH IN SIZE AND IN FLOAT.

COAL No. 26
APPENDIX I, VOL. III

veral densities

THE CASCADE COAL BASIN.

ERRATUM

On the curve diagrams accompanying the tabulated records of each of the coals tested, is the following legend:—

LEGEND: SYMBOLS

○ Curve showing the relative quantities of the several sizes
△ " " " " " " " " densities
□ " " " percentage of ash in each of the several sizes
● " " " " " " " material floating at the several densities

The above legend is incorrect; in each case it should read thus:—

○ Curve showing the relative quantities of the several sizes
□ " " " percentage of ash in each of the several sizes
● " " " " " material floating at the several densities.
△ " " " " " ash in " " " " "

COAL No. 25

Locality.—Cascade coal field, Canmore, Alberta.

Colliery.—H. W. McNeil Co. Old No. 1 mine.

Sample.—One hundred and fifty bags from the east workings of the old mine. The sample, as it came from the mine, was screened, and the lump portion, approximately one-fourth of the whole, was hand picked, the lumps then being returned to the screenings, and the whole sacked. The sample may, therefore, be said to consist of 75 per cent run of mine and 25 per cent of hand picked lump. Sampled April 22, 1908.

TABLE A.

Specific Gravity Tests.

	Specific gravity of solution.	Float %	Ash in Float %	Sink %	Ash in Sink %
1.	1·525	84·3	3·4	15·7	48·6
2.	1·400	83·0		17·0	
3.	1·380.	75·4	2·1	24·6	38·0
4.	1·320	67·3	2·0	32·7	28·7

The following results are obtained from the above data, and from the chemists' results:—

5.	Good coal, Sp. Gr. under 1·375	% yield 74·5 %, ash	2·5
6.	Bone coal, Sp. Gr. 1·375 to 1·55	" " 9·5 " "	13·2
7.	Useful coal—sum of (5) and (6)	" " 84·0 " "	3·7
8.	Refuse, Sp. Gr. over 1·55	" " 16·0 " "	50·6
9.	Assay of original sample raw coal as sent to chemist	" "	12·3
10.	" " " " " "	% sulphur	0·8
11.	" " " " " "	Fuel Ratio	4·10
12.	Assay of mixed good and bone coal (5) and (6)	" "	5·12

Remarks.—The innate ash in this coal is very high, and the amount of bone coal moderate, and with rather high ash, while the refuse is high, although low in ash. The coal can be considerably improved by washing, as so large a proportion of the ash is in the refuse. This coal is anthracitic in character, although by no means a true anthracite.

TABLE B

Screen Analysis.

	Maximum Screen MM.	Minimum Screen MM	Mean MM	% of whole sample	% Ash in size
13	6·34	3·16	4·75	42·0	12·9
14	3·16	1·20	2·18	18·7	12·0
15	1·20	0·64	0·92	14·5	10·4
16.	0·64	0·30	0·47	9·6	10·3
17	0·30	0·173	0·24	8·5	8·7
18.	0·173	0·000	0·086	6·7	8·3

Remarks.—The decreasing proportion of ash in the finer sizes shows that the coal is more friable than the ash-bearing material, and this is particularly noticeable, as the sample contained a large amount of screenings, which, ordinarily, are high in ash. In the circumstances, the proportion of fines is not large and their impurity not unexpectedly great. The coal is hard, and stands handling and shipment fairly well.

TABLE C.

Results of Washing (Details of Sizes).

	Original coal and its products.	Sizes between 1" and ½" Total wt. lbs.	Ash. %	Sizes between ½" and ¼" Total wt. lbs.	Ash. %	Sizes under ¼" Total wt lbs.	Ash. %
19.	Original coal	2275	13·4	2045	9·5	2540	9·2
20.	Washed coal	1863	6·8	1761	5·0	1643	5·8
21	Refuse—coarse	360	59·8	189	51·5	142	44·4
22.	Hutch product	38	16·6	90	29·5	....	...
23.	Jig slimes		...	12	....	....	....
24.	Table slimes		...	...	..	330	6·4

TABLE D.

Results of Washing (Totals).

25.	Original coal	wt. in lbs.	6860	% ash	12·3	% sulphur	0·8
26.	Washed coal	" "	5597	" "	5·9	" "	0·7
27.	Refuse	" "	691	" "	54·1	" "	
28.	Other products	" "	481	" "	....	" "	
29.	Loss	" "	91	" "	..	" "	
30.	Loss in % 1·3						

TABLE E

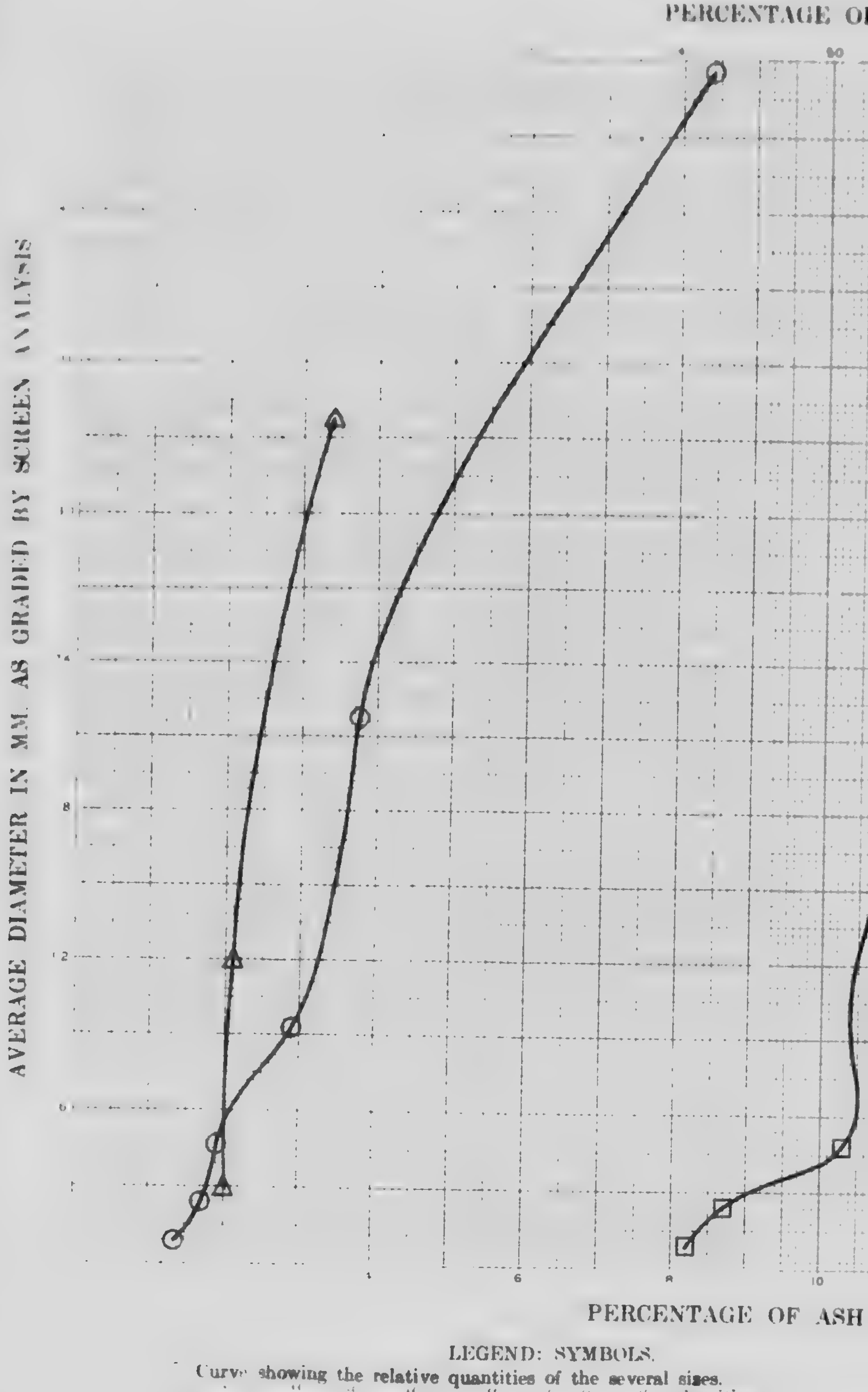
Summary Statement of Effect of Washing on Fuel Values.

31.	Recovery of washed coal, including good bone	%	81·5	Ratio to standard	97·0
32.	Reduction in ash	%	52·0	" "	62·7
33.	" " sulphur	%	12·5	.. ..	
34.	Increase in calorific value—calorimeter	%	9·0	.. ..	
35.	Increase in evaporation under boiler	%	13·1		
36.	Decrease in clinker under boiler	%	43·2		
37.	Fuel ratio of original coal		4·10		
38.	" " washed "		4·80		
39.	Calorific value of original coal		7340		
40.	" " washed "		8000		

Remarks on Tables C, D, and E.—This trial was fairly satisfactory, and the washed coal proved decidedly better than the unwashed, both in chemical tests and in practical treatment.

AVERAGE DIAMETER IN MM. AS GRADED BY SCREEN ANALYSIS

GRAPHIC RECORD OF SIZIN



LEGEND: SYMBOLS.

Curve showing the relative quantities of the several sizes.

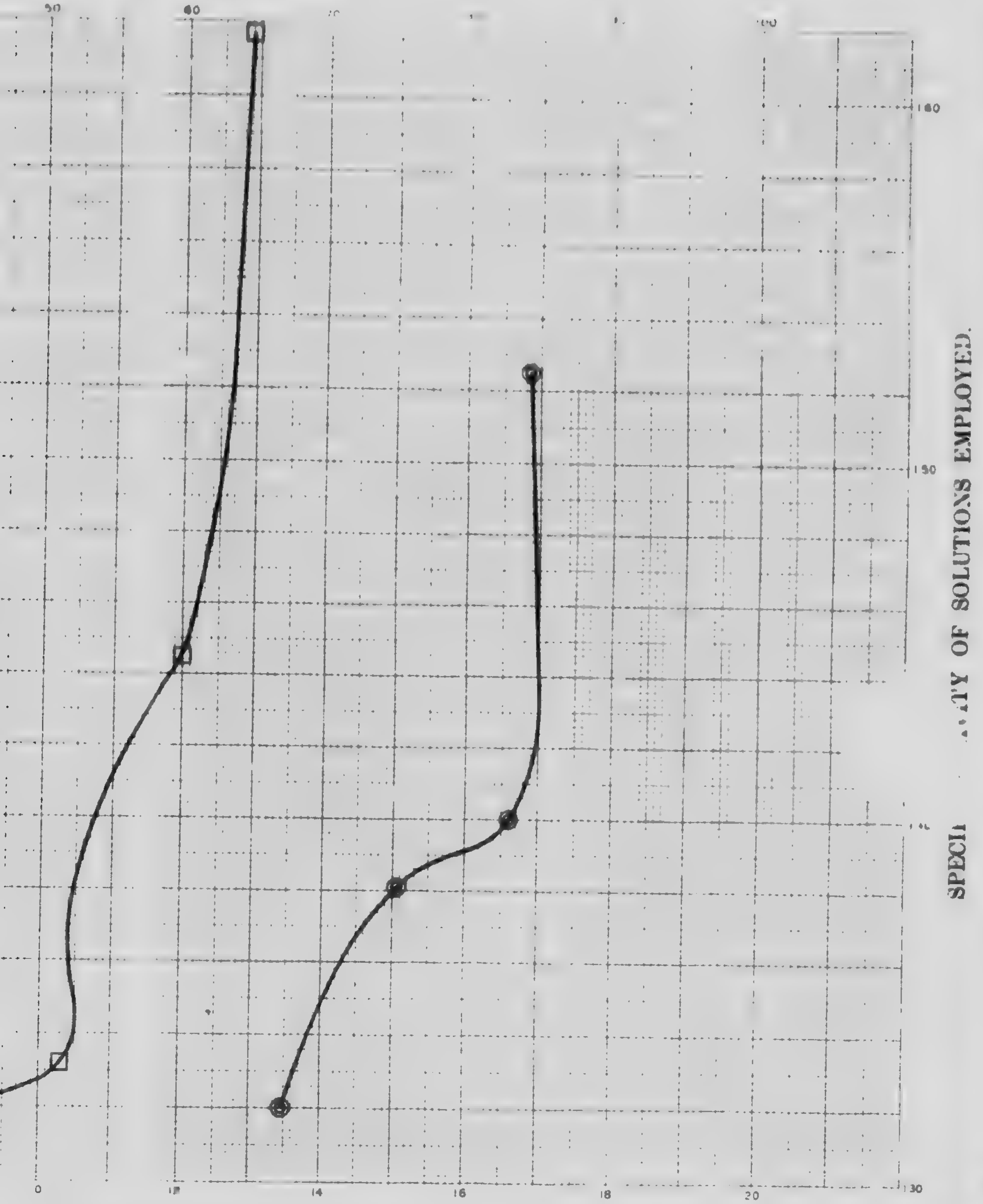
" " " " " " " densities.

" " " percentage of ash in each of the several sizes.

○ " " " " " " material floating at the several d

SIZING AND SPECIFIC GRAVITY TESTS

AGE OF SIZE AND OF FLOAT



F ASH IN SIZE AND IN FLOAT.

COAL No. 25
APPENDIX I, VOL. III

s.
several densities

COAL.—No. 23 M.

Locality.—Cascade coal field, Banff, Alberta.

Colliery.—Bankhead colliery.

Sample.—This coal is a mixture of two sizes of dry cleaned coal from the Bankhead plant.

Sixty sacks of pea coal, drawn from the bunkers. This coal was mined between April 18 and 20, 1908, and had received the usual treatment; that is to say, it had been through a [illegible]" screen and on [illegible]", and had been cleaned by slater bars and Emery picker.

Sixty sacks o buckwheat No. 1 taken from the bunkers, as above. These sizes had passed through $\frac{7}{16}$" screen and on $\frac{7}{16}$": it had been cleaned on the slate picker, but not on the Emery picker. Sampled April 21, 1908.

TABLE A.

Specific Gravity Tests.

	Specific gravity of solution.	Float %	Ash in Float %	Sink %	Ash in Sink %
1.	1·510	78·3	6·2	21·7	45·7
2.	1·430	73·9	4·6	26·1	41·9
3.	1·375	58·0	2·7	42·0	34·6
4.	1·340	42·3	2·0	57·7	24·0

The following results are obtained from the above data, and from the chemists results:—

5.	Good coal, Sp. Gr. under 1·375	% yield	58·0	% ash	2·7
6.	Bone coal, Sp. Gr. 1·375 to 1·55	" "	21·0	" "	17·2
7.	Useful coal—sum of (6) and (7)	" "	79·0	" "	6·0
8.	Refuse, Sp. Gr. over 1·55	" "	21·0	" "	46·0
9.	Assay of original sample raw coal as sent to chemist			" "	14·1
10.	" " " " " "			% sulphur	0·6
11.	" " " " " "			Fuel Ratio	5·80
12.	Assay of mixed good and bone coal (5) and (6)			" "	6·51

Remarks.—The specific gravity solutions used in this investigation were chosen for bituminous coals, and are rather low in gravity for an anthracite such as this Bankhead material. It would probably be more just to take 1·6 as the dividing point between coal and refuse. If so, the float, or useful coal, would amount to 83 per cent, with about 7½ per cent of ash, while the refuse would carry 50 per cent of ash.

This coal can be greatly improved by washing, or equivalent treatment, as the innate ash is low and the amount of refuse large, although with comparatively low ash.

TABLE B

Screen Analysis.

	Maximum Screen MM.	Minimum Screen MM.	Mean MM.	% of whole sample	% Ash in size
13.	6·34	3·16	4·75	77·9	14·8
14.	3·16	1·20	2·18	12·2	11·9
15.	1·20	0·64	0·92	5·4	11·7
16.	0·64	0·30	0·47	2·2	10·0
17.	0·30	0·173	0·24	1·5	15·3
18.	0·173	0·050	0·086	0·8	18·8

Remarks.—The sample was of cleaned and screened coal, and, therefore the amount of fines made, even in crushing it to ¼″, was small. The large percentage of ash in the finest sizes probably indicates the presence in the sample of some fine dirt from the original coal.

TABLE C

Results of Washing (Details of Sizes).

	Original coal and its products.	Sizes between 1″ and ½″ Total wt. lbs.	Ash. %	Sizes between ½″ and ⅛″ Total wt. lbs.	Ash. %	Sizes under ⅛″ Total wt. lbs.	Ash. %
19.	Original coal	4387	14·6	1940	12·7	552	12·0
20.	Washed coal	3890	8·9	1588	7·3	309	
21.	Refuse—coarse	438	57·2	164	56·4	36	
22.	Hutch product	50	37·0	125	38·0	....	..
23.	Jig slimes	....	....	81	29·7	....	..
24.	Table slimes	....	....	....	....	35	13·1

TABLE D.

Results of Washing (Totals).

25.	Original coal	wt. in lbs.	6879	% ash	14·1	% sulphur	0·6
26.	Washed coal	" "	5787	" "	8·9	" "	0·6
27.	Refuse	" "	638	" "	55·4	" "	
28.	Other products	" "	293	" "	....	" "	
29.	Loss	" "	161	" "		" "	
30.	Loss in % 2·3						

TABLE E.

Summary Statement of Effect of Washing on Fuel Values.

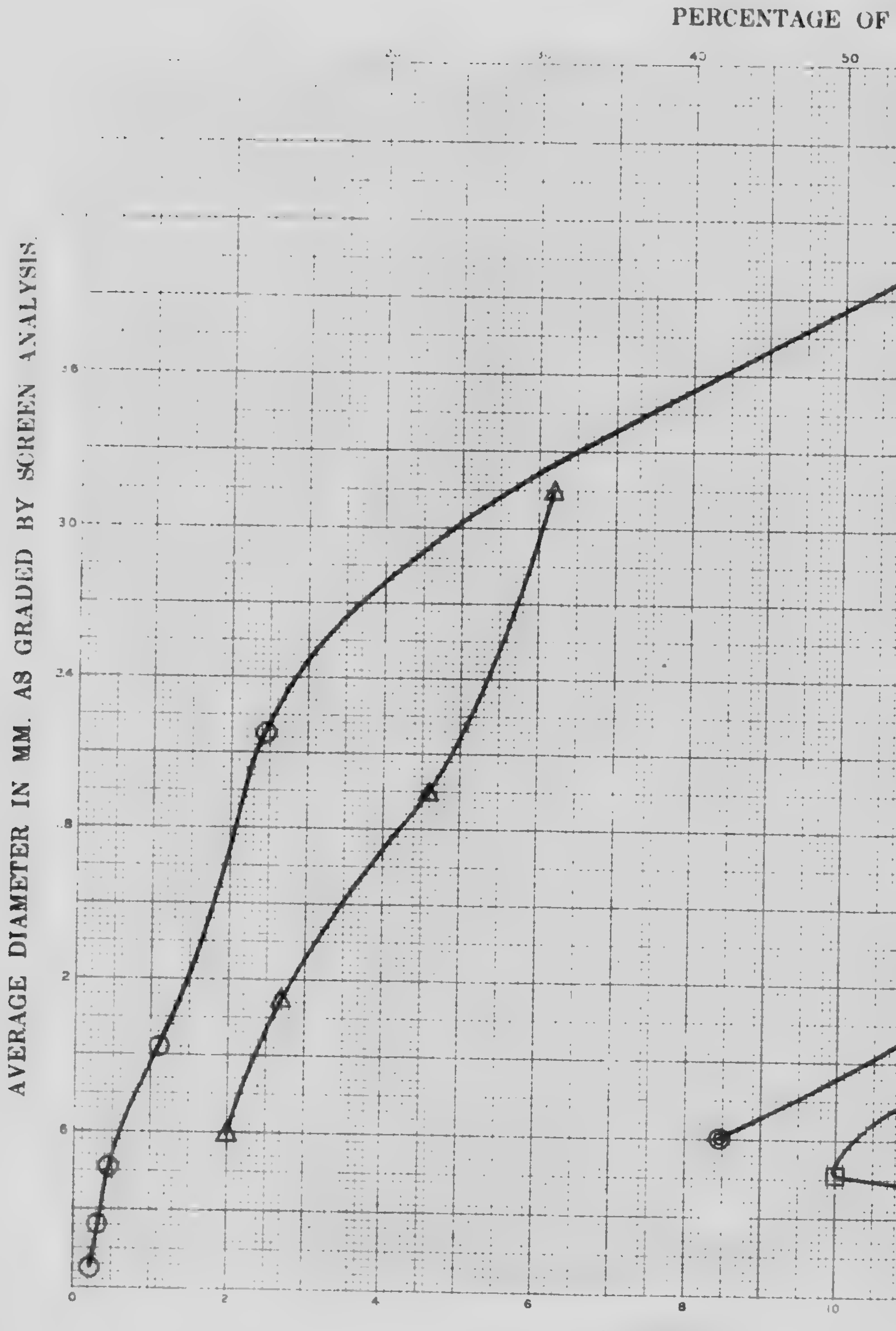
31.	Recovery of washed coal, including good bone	%	84·0	Ratio to standard	166·2
32.	Reduction in ash	%	36·9	" "	67·4
33.	" " sulphur	%	0·0	" "	
34.	Increase in calorific value—calorimeter	%	6·7		
35.	Increase in evaporation under boiler	%	14·1		
36.	Decrease in clinker under boiler	%	36·7		
37.	Fuel ratio of original coal		5·80		
38.	" " washed "		6·29		
39.	Calorific value of original coal		7270		
40.	" " washed "		7760		

Remarks on Tables C, D, and E.—In washing this sample, a deliberate attempt was made to work to a somewhat higher specific gravity than would have been desirable with ordinary bituminous coal. Therefore, the recovery of washed coal is somewhat higher than that intimated by the preliminary trials, in Table A. The washed coal also contains more ash. The results of this test were also somewhat affected by the accidental loss of a considerable amount of very fine dust. his dust, however, is only useful in practice for briquetting, it is probable that the results do not differ greatly from what would be the results of commercial washing.

It should be pointed out that this sample had already been treated in a dry washer, or "slater" plant. The improvement, therefore, is considerably less than it would have been had run of mine coal been available.

AVERAGE DIAMETER IN MM. AS GRADED BY SCREEN ANALYSIS

GRAPHIC RECORD OF SIZING

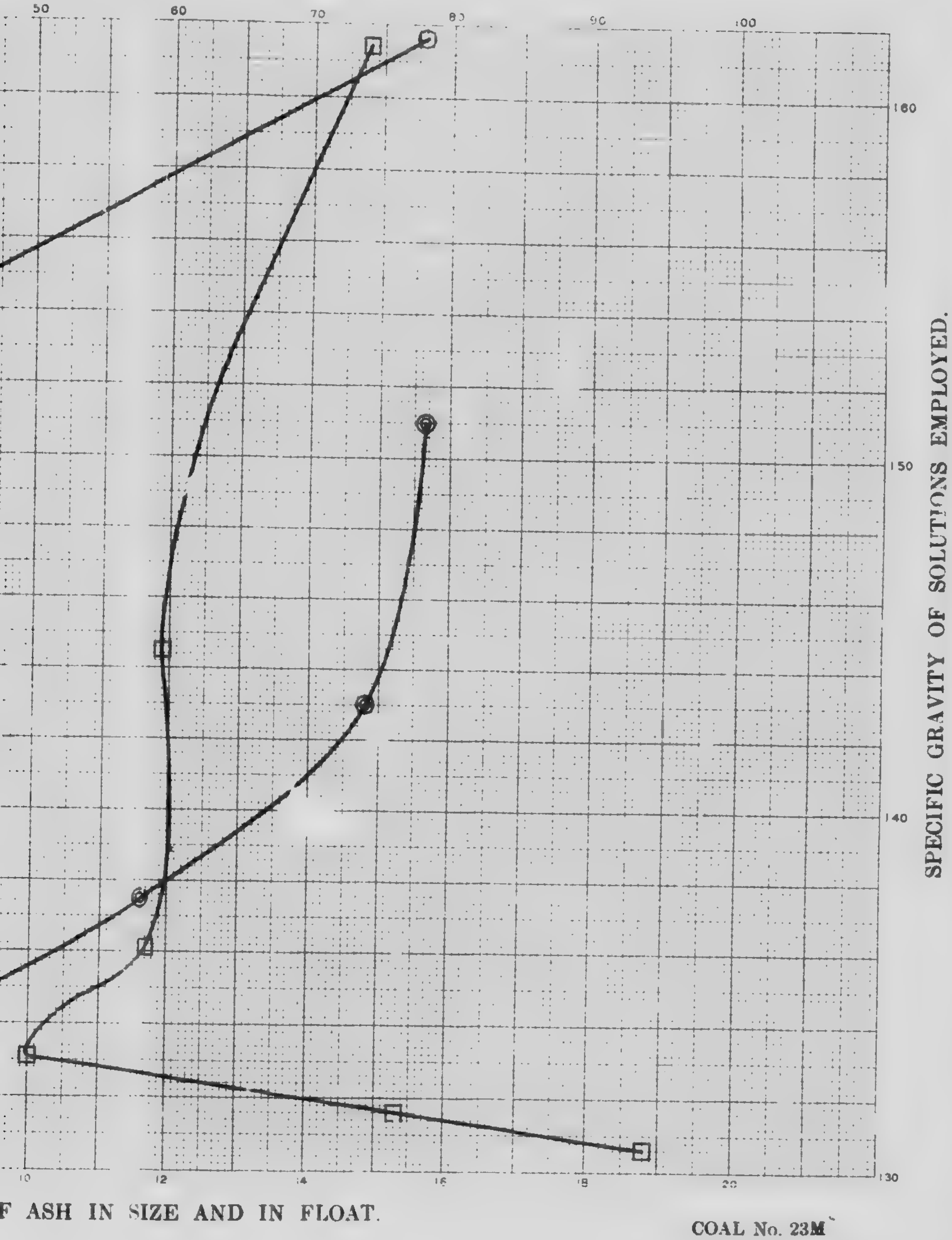


LEGEND: SYMBOLS.

○ Curve showing the relative quantities of the several sizes.
△ " " " " " " " " densities.
□ " " " percentage of ash in each of the several sizes.
◉ " " " " " " " material floating at the several de

IZING AND SPECIFIC GRAVITY TESTS.

GE OF SIZE AND OF FLOAT.



COAL No. 23M
Appendix I, Vol. III

several densities

SIMILKAMEEN VALLEY.

GRANITE CREEK COALS.

ERRATA.

On the curve diagrams [illegible] the [illegible] of each of the [illegible] tested [illegible] the following legend

LEGEND. SYMBOLS

[illegible]

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15

COAL.—No. EX. 1.

Locality.—Granite Creek, Princeton district, B.C.

Colliery.—Prospecting tunnel, No. 1.

Sample.—This sample of about 150 pounds was taken by Dr. Porter in June, 1908, at the face of the tunnel. It correctly represents the workable bench at about 100 feet in from the surface, but the coal may improve somewhat with depth.

TABLE A

Specific Gravity Tests.

	Specific gravity of solution.	Float %	Ash in Float %	Sink %	Ash in Sink %
1.	1·530	91·0	8·1	9·0	55·7
2	1·430	87·0	6·9	13 0	48·1
3.	1·370	83·5	5·7	16·5	43·7
4.	1·320	52·5	3·4	47 5	21·1

The following results are obtained from the above data, and from the chemists results :—

5.	Good coal, Sp. Gr. under 1·375	% yield	84·0	% ash	5·9
6.	Bone coal, Sp. Gr. 1·375 to 1·55	" "	7·5	" "	25·0
7.	Useful coal—sum of (5) and (6)	" "	91·5	" "	8·2
8.	Refuse, Sp. Gr. over 1·55	" "	8·5	" "	56·7
9.	Assay of original sample raw coal as sent to chemist			" "	12·3
10.	" " " " " "			% sulphur	
11	" " " " " "			Fuel Ratio	1·60
12	Assay of mixed good and bone coal (5) and (6)			" "	

Remarks.—The innate ash is a little higher than usual, but this is possibly due to the sample having been taken in a shallow prospecting tunnel, and comparatively near the surface. Bone coal and refuse are comparatively small in quantity, but they are high in ash.

The coal would wash well, but the best results could only be got by lowering the standard for refuse to a little below 1·55 specific gravity.

TABLE B

Screen Analysis.

	Maximum Screen MM.	Minimum Screen MM.	Mean MM.	% of whole sample	% Ash in size.
13.	6·34	3·16	4·75	. .	
14.	3·16	1·20	2·18		
15.	1·20	0·64	0·92		
16.	0·64	0·30	0·47		
17.	0·30	0·173	0·24		
18.	0·173	0·000	0·086		

Remarks.—No screen analyses were made as the sample was from too near the surface.

TABLE C.

Results of Washing (Details of Sizes).

	Original coal and its products	Sizes between 1'' and ½'' Total wt. lbs.	Ash %	Sizes between ½'' and ¼'' Total wt. lbs.	Ash %	Sizes under ¼'' Total wt. lbs.	Ash %
19.	Original coal						
20.	Washed coal						
21.	Refuse—coarse						
22.	Hutch product	This coal was washed on a small scale only					
23.	Jig slime						
24.	Table stones						

TABLE D.

Results of Washing (Totals).

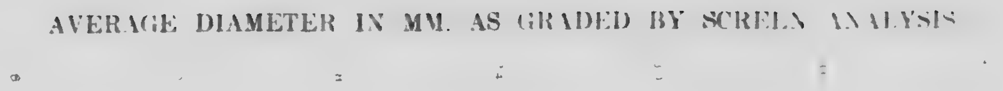
25.	Original coal	wt. in lbs.	% ash 12·3	% sulphur
26.	Washed coal	" "	" " 7·9	" "
27.	Refuse	" "	" "	" "
28.	Other products	" "	" "	" "
29.	Loss	" "	" "	" "
30.	Loss in %	" "	" "	" "

TABLE E.

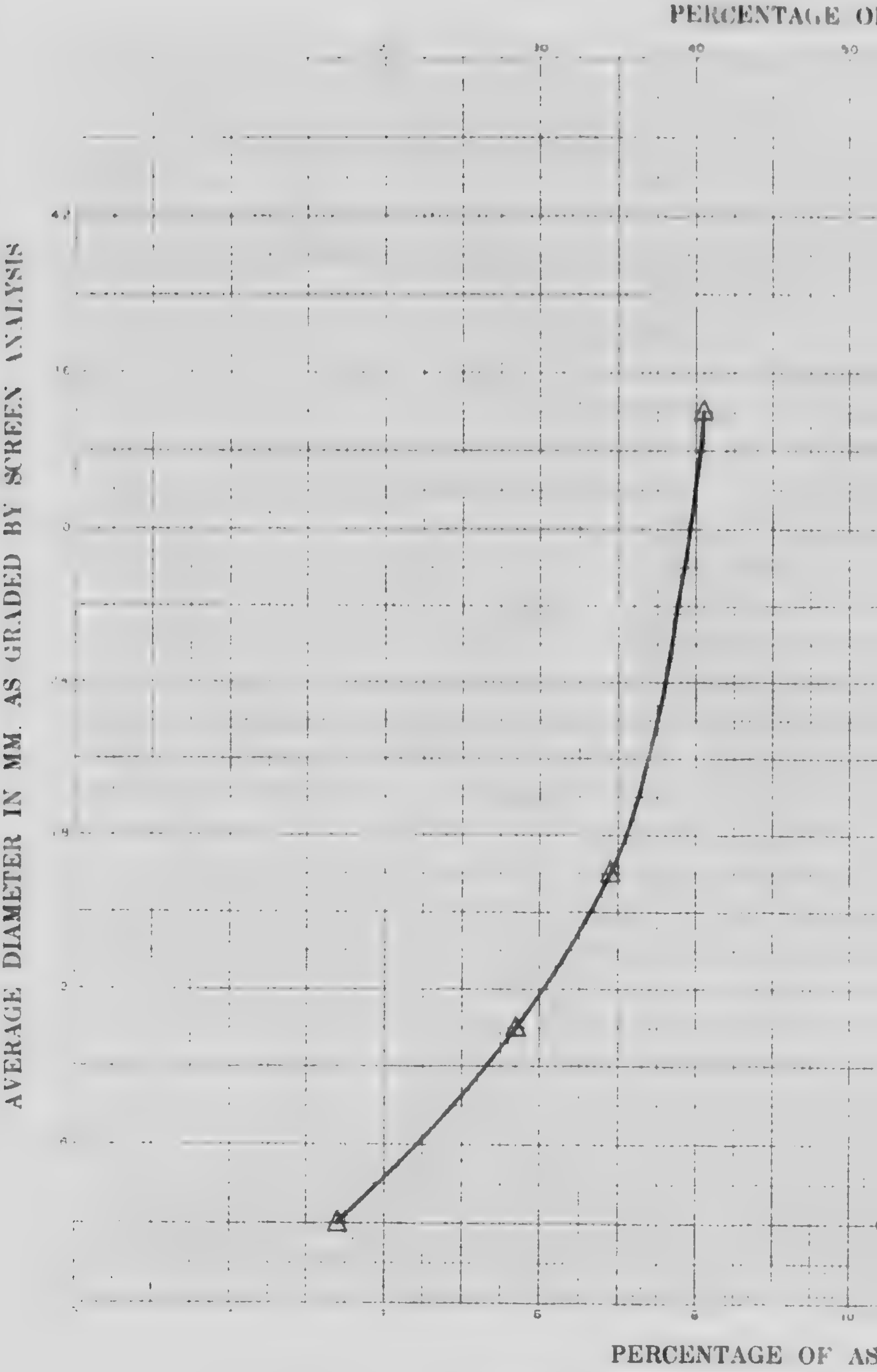
Summary Statement of Effect of Washing on Fuel Values.

31.	Recovery of washed coal, including good bone	%	85·0	Ratio to standard 92·9
32.	Reduction in ash	%	35·7	" " 103·8
33.	" " sulphur	%		" "
34.	Increase in calorific value—calorimeter	%		
35.	Increase in evaporation under boiler	%		
36.	Decrease in clinker under boiler	%		
37.	Fuel ratio of original coal			
38.	" " washed "		1·60	
39.	Calorific value of original coal			
40.	" " washed "			

Remarks on Tables C, D, and E.—This trial was made on a small scale, and although the results may be considered satisfactory, better work could undoubtedly be done on a commercial scale.


AVERAGE DIAMETER IN MM. AS GRADED BY SCREEN ANALYSIS

GRAPHIC RECORD OF SIZIN

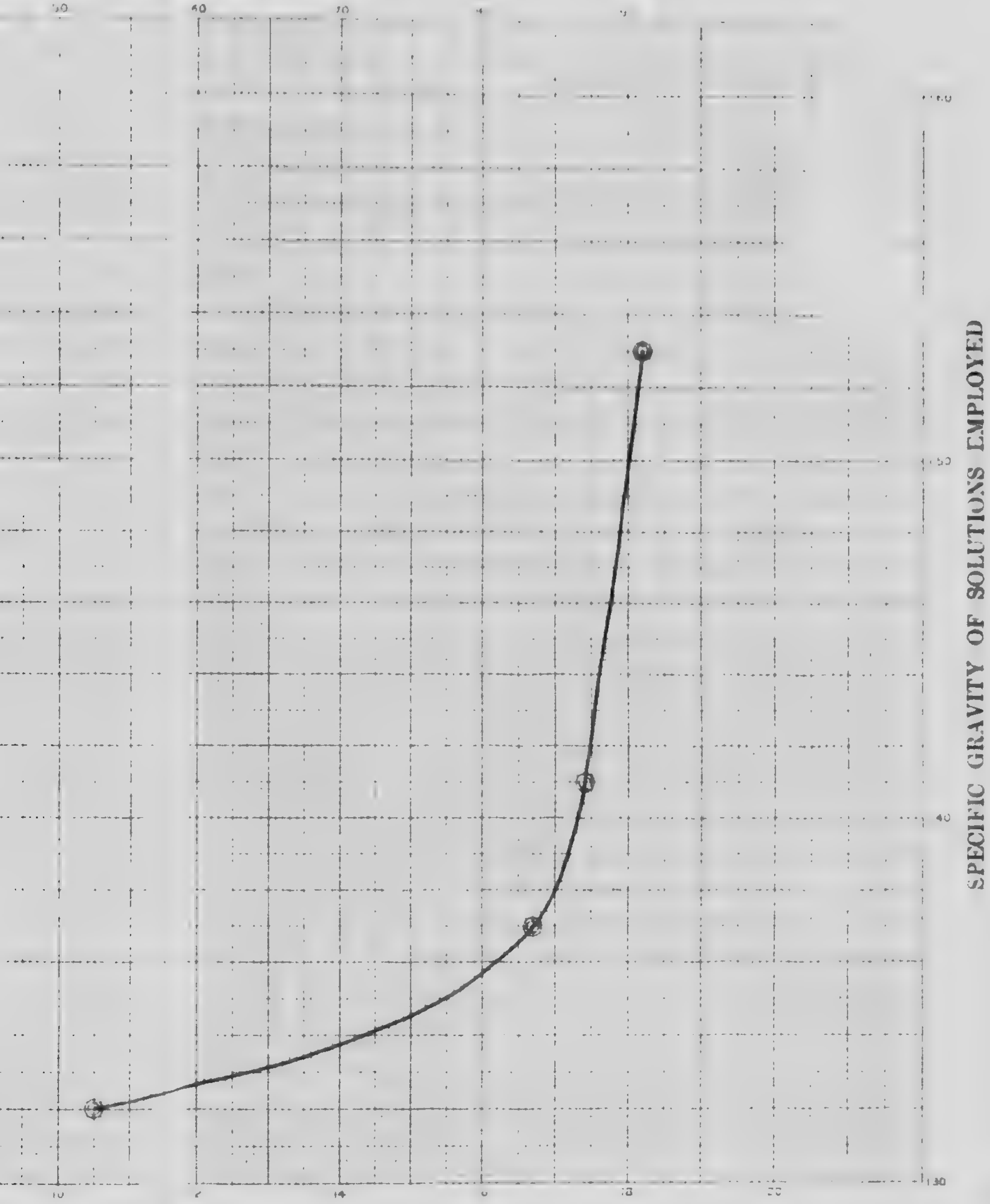


LEGEND: SYMBOLS.

Curve showing the relative quantities of the several sizes
△ “ “ “ “ “ “ “ “ densities.
□ “ “ “ percentage of ash in each of the several sizes.
○ “ “ “ “ “ “ “ material floating at the severa

SIZING AND SPECIFIC GRAVITY TESTS.

AGE OF SIZE AND OF FLOAT.



OF ASH IN SIZE AND IN FLOAT.

COAL No. Ex. 1
Appendix I, Vol. III

sizes.
the several densities

COAL. No. EX. 2.

Locality.—Granite Creek, Princeton district, B.C.

Colliery.—Prospecting tunnel, No. 2.

Sample.—This sample, of about 150 pounds, was taken by Dr. Porter in June, 1908, at the face of the tunnel, and correctly represents the workable bench at about 100 feet in from the surface. The coal was, however, slightly weathered and will no doubt improve with depth.

TABLE A

Specific Gravity Tests.

	Specific gravity of solution.	Float %	Ash in Float %	Sink %	Ash in Sink %
1.	1·525	89·1	8·6	10·9	55·5
2.	1·410	82·5		17·5	
3.	1·365	75·0	5·9	25·0	38·6
4.	1·320	36·0	3·9	64·0	19·3

The following results are obtained from the above data and from the chemists results :

5.	Good coal, Sp. Gr. under 1·375	% yield	77·9	% ash	6·2
6.	Bone coal, Sp. Gr. 1·375 to 1·55	" "	12·1	" "	24·8
7.	Useful coal—sum of (5) and (6)	" "	90·0	" "	8·8
8.	Refuse, Sp. Gr. over 1·55	" "	10·0	" "	60·0
9.	Assay of original sample raw coal as sent to chemist			" "	14·0
10.	" " " " " "			% sulphur	1·9
11	" " " " " "			Fuel Ratio	1·65
12.	Assay of mixed good and bone coal (5) and (6)			" "	

Remarks.—The innate ash is a little high. The bone and refuse are moderately low in quantity but high in ash. The coal will wash well, but the standard of 1·55 specific gravity for refuse is probably high in view of the large amount of ash in the bone.

TABLE B

Screen Analysis.

	Maximum Screen MM.	Minimum Screen MM.	Mean MM.	% of whole sample	% Ash in size
13.	6·34	3·16	4·75		
14.	3·16	1·20	2·18		
15.	1·20	0·64	0·92		
16.	0·64	0·30	0·47		
17.	0·30	0·173	0·24		
18.	0·173	0·000	0·086		

Remarks.—No screen analyses were made on this coal.

TABLE C.

Results of Washing (Details of Sizes).

	Original coal and its products.	Sizes between 1″ and ½″ Total wt. lbs.	Ash. %	Sizes between ½″ and ⅛″ Total wt. lbs.	Ash. %	Sizes under ⅛″ Total wt. lbs.	Ash. %
19.	Original coal						
20.	Washed coal..						
21.	Refuse—coarse						
22.	Hutch product						
23.	Jig slimes.						
24.	Table slimes						

TABLE D.

Results of Washing (Totals).

25.	Original coal.	wt. in lbs.	% ash	14·0	% sulphur		1·9
26.	Washed coal.	"	"	10·4	"	"	1·8
27.	Refuse.	"	"		"	"	
28.	Other products.	"	"		"	"	
29.	Loss.	"	"		"	"	
30.	Loss in %	"	"		"	"	

TABLE E.

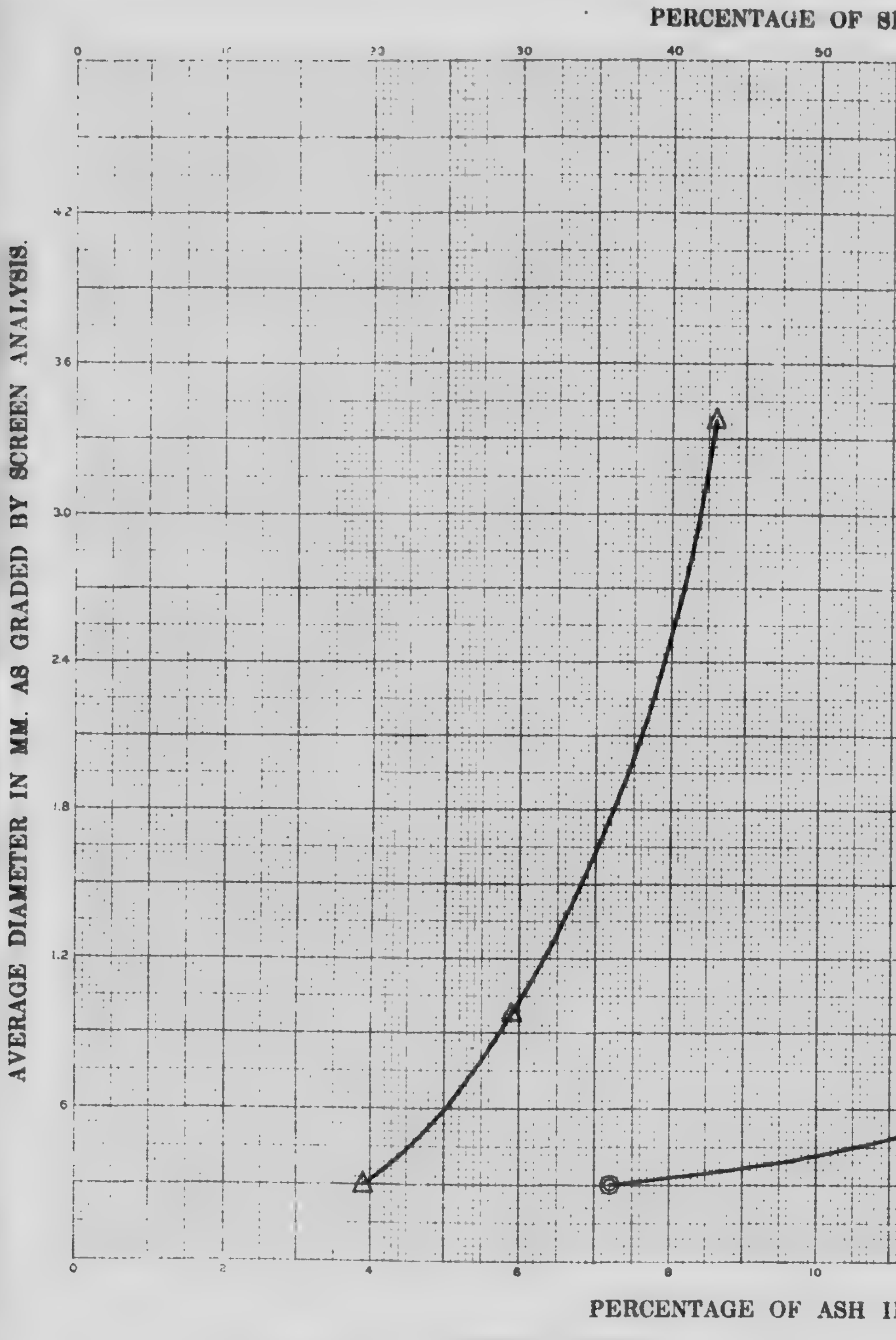
Summary Statement of Effect of Washing on Fuel Values.

31.	Recovery of washed coal, including good bone	%	90·0	Ratio to standard	100·0
32.	Reduction in ash.	%	25·7	" "	84·6
33.	" " sulphur.	%	5·3	" "	
34.	Increase in calorific value—calorimeter	%			
35.	Increase in evaporation under boiler.	%			
36.	Decrease in clinker under boiler.	%			
37.	Fuel ratio of original coal.		1·65		
38.	" " washed "				
39.	Calorific value of original coal				
40	" " washed "				

Remarks on Tables C, D, and E.—This trial was made on a small scale, and while it proved satisfactory it is probable that better results could be obtained in practice, especially if a somewhat larger quantity of refuse were made.

AVERAGE DIAMETER IN MM. AS GRADED BY SCREEN ANALYSIS

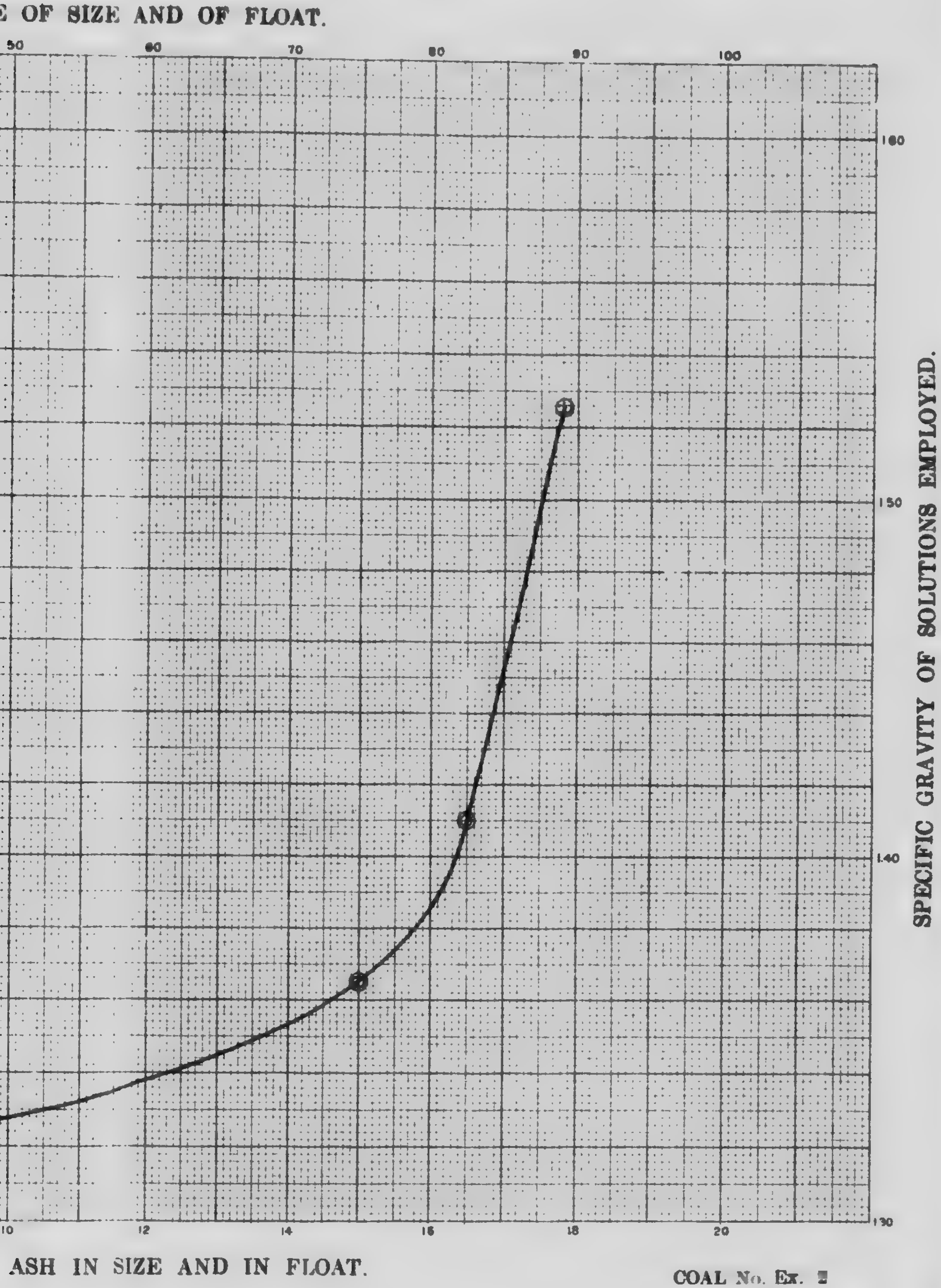
GRAPHIC RECORD OF SIZING A



LEGEND: SYMBOLS.

○ Curve showing the relative quantities of the several sizes.
△ " " " " " " " " densities.
▢ " " " percentage of ash in each of the several sizes.
◉ " " " " " " " material floating at the several den

ZING AND SPECIFIC GRAVITY TESTS.



COAL No. Ex. 2
Appendix I, Vol. III

everal densities.

COAL.—No. EX. 3.

Locality.—Granite Creek, Princeton district, B.C.

Colliery.—Prospecting tunnel, No. 4.

Sample.—This sample, of about 150 pounds, was taken by Dr. Porter in June, 1908, at the face of the tunnel about 150 feet from the surface. The coal was not free from signs of weathering, and it is probable that it would be found to improve considerably with depth.

TABLE A.

Specific Gravity Tests.

	Specific gravity of solution.	Float %	Ash in Float %	Sink %	Ash in Sink %
1.	1·525	87·0	11·4	13·0	51·0
2.	1·400	73·4	9·7	26·6	36·4
3.	1·365	61·1	6·6	38·9	30·6
4.	1·320	37·0	3·7	63·0	24·4

The following results are obtained from the above data, and from the chemists results .—

5.	Good coal, Sp. Gr. under 1·375	% yield	65·0	% ash	7·3
6.	Bone coal, Sp. Gr. 1·375 to 1·55	" "	23·0	" "	23·6
7.	Useful coal—sum of (5) and (6)	" "	88·0	" "	11·6
8.	Refuse, Sp. Gr. over 1·55	" "	12·0	" "	57·0
9.	Assay of original sample raw coal as sent to chemist			" "	16·6
10.	" " " " " "			% sulphur	
11.	" " " " " "			Fuel Ratio	1·62
12.	Assay of mixed good and bone coal (5) and (6)			" "	

Remarks.—The innate ash is high and the bone and refuse are higher than in the other samples from the property, but these differences are due in part at least to the fact that the coal was more weathered. In spite of this the refuse is low in quantity as compared with the average of western coals. The ash in both refuse and bone is high, and the coal would wash well, especially if a lower specific gravity standard than 1·55 were taken for the line of demarcation between useful bone and refuse.

TABLE B

Screen Analysis.

	Maximum Screen MM.	Minimum Screen MM.	Mean MM.	% of whole sample	% Ash in size
13.	6·34	3·16	4·75		
14.	3·16	1·20	2·18		
15.	1·20	0·64	0·92		
16.	0·64	0·30	0·47		
17.	0·30	0·173	0·24		
18.	0·173	0·000	0·086		

Remarks.—No screen analyses were made on this sample.

TABLE C.

Results of Washing (Details of Sizes.)

	Original coal and its products.	Sizes between 1" and ¼" Total wt. lbs.	Ash. %	Sizes between ¼" and ⅛" Total wt. lbs.	Ash. %	Sizes under ⅛" Total wt. lbs.	Ash. %
19.	Original coal						
20.	Washed coal						
21.	Refuse—coarse						
22.	Hutch product						
23.	Jig slimes						
24.	Table slimes						

TABLE D.

Results of Washing (Totals).

25.	Original coal	wt. in lbs.	% ash 16·6	% sulphur
26.	Washed coal	" "	" " 13·9	" "
27.	Refuse	" "	" "	" "
28	Other products	" "	" "	" "
29.	Loss	" "	" "	" "
30.	Loss in %		" "	" "

TABLE E.

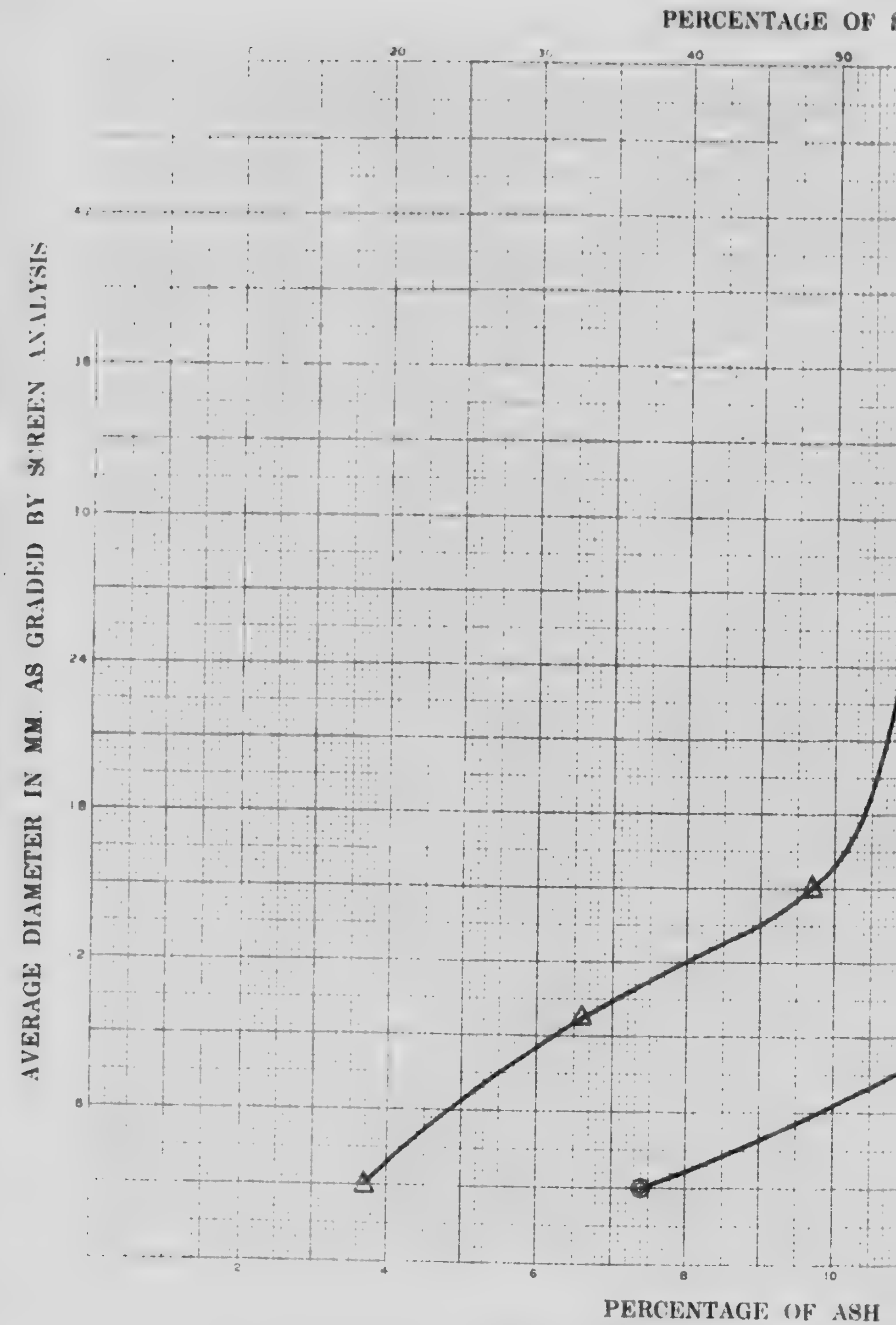
Summary Statement of Effect of Washing on Fuel Values.

31.	Recovery of washed coal, including good bone	%	90·0	Ratio to standard	102·2
32.	Reduction in ash	%	13·2	" "	83·4
33.	" " sulphur	%		" "	
34.	Increase in calorific value—calorimeter	%			
35.	Increase in evaporation under boiler	%			
36.	Decrease in clinker under boiler	%			
37.	Fuel ratio of original coal	%			
38.	" " washed "		1·62		
39.	Calorific value of original coal				
40.	" " washed "				

Remarks on Tables C, D, and E.—This trial was made on a very small scale, and while it gave satisfactory results, it is probable that better work could be done on a commercial scale. This is especially true as the sample was from near the surface, and probably more friable and dirty than it should be. The standard for separating bone and refuse is also a little too high for this coal.

AVERAGE DIAMETER IN MM. AS GRADED BY SCREEN ANALYSIS
2
3
4

GRAPHIC RECORD OF SIZING

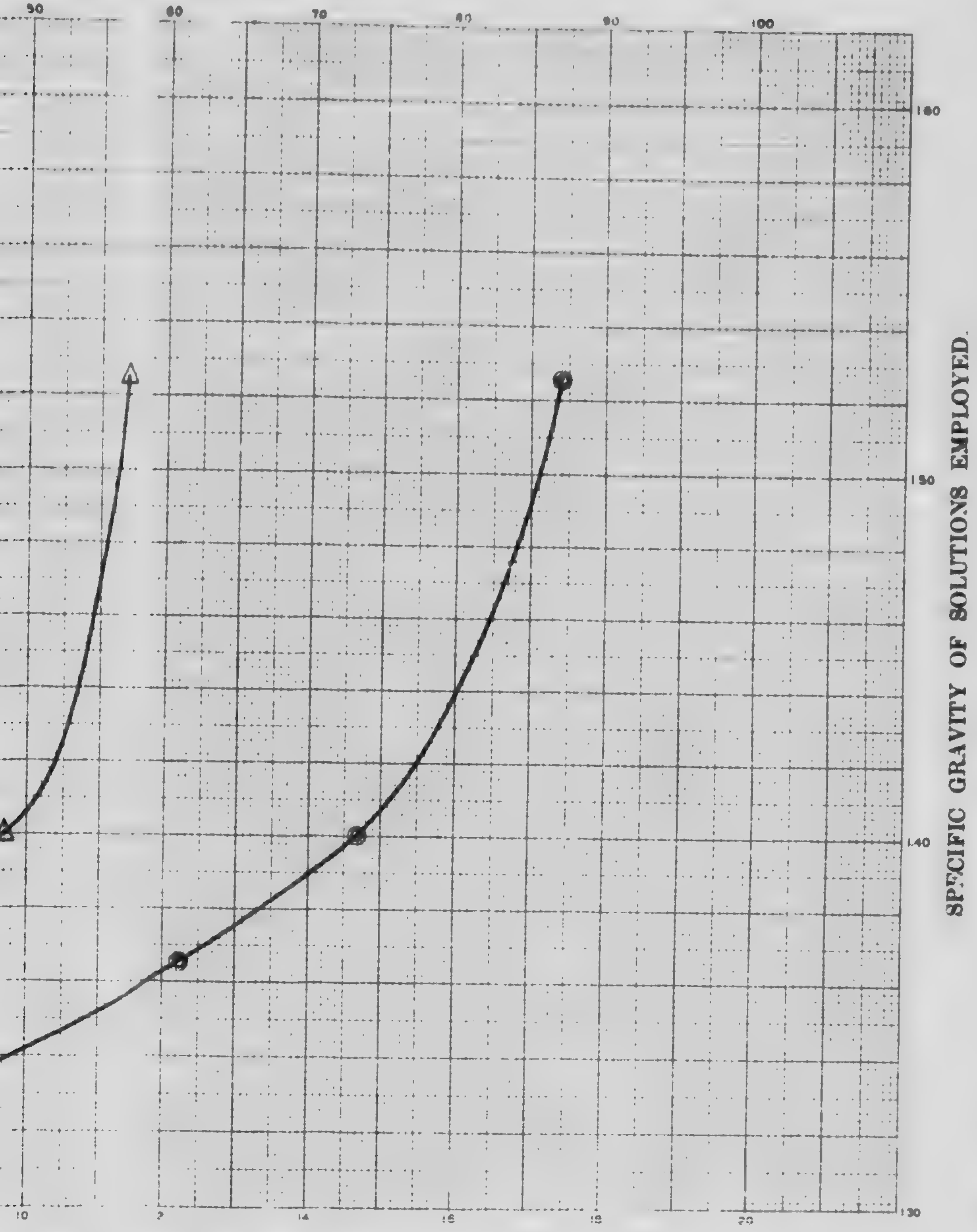


LEGEND: SYMBOLS.

○ Curve showing the relative quantities of the several sizes.
△ " " " " " " " densities.
□ " " " percentage of ash in each of the several sizes.
◎ " " " " " " material floating at the several de

IZING AND SPECIFIC GRAVITY TESTS.

E OF SIZE AND OF FLOAT.



F ASH IN SIZE AND IN FLOAT.

COAL No. Ex. 3
Appendix I, Vol. III

several densities

NICOLA VALLEY FIELD.

ERRATUM

[illegible] following legend

LEGEND—SYMBOLS

[illegible]

The above legend is incorrect; in each case it should read thus

[illegible]

COAL.—No. 22 M.

Locality.—Coutlee, Nicola, B.C.

Colliery.—Nicola Valley Coal and Coke Co., Middlesboro colliery· Nos. 1 and 2 mines.

Sample.—The main sample was taken from No. 1 colliery, and the smaller sample from No 2. These were accidentally mixed, but as the quantity of No. 2 was very small and its quality very much the same as No. 1, it was not considered necessary to resample.

No. 1 mine: one hundred and forty bags taken from the Jewel seam, near Coal gully. The sample represents a good average of the workings, which were in the development stage, the main tunnel being only 1,250 feet long. The sample was taken from a lot of 600 tons of freshly mined coal.

No. 2 mine: ten sacks from the deeper workings of No. 2 mine, in Rat Hole seam, on Coldwater hill. Sampled April 18, 1908.

TABLE A.

Specific Gravity Tests.

	Specific gravity of solution.	Float %	Ash in Float %	Sink %	Ash in Sink %
1.	1·51 . .	88·4	8·6	11·6	52·2
2.	1·43.	80·3	6·7	19·7	46·3
3	1·37	73·5	6·1	26·5	36·8
4.	1·34.	65·0	4·8	35·0	33·8

The following results are obtained from the above data, and from the chemists results :—

5.	Good coal, Sp. Gr. under 1·375	% yield 74·5 % ash	6·1
6.	Bone coal, Sp. Gr. 1·375 to 1·55	" " 16·5 " "	23·6
7.	Useful coal—sum of (5) and (6) . . .	" " 91·0 " "	9·2
8.	Refuse, Sp. Gr. over 1·55	" " 9·0 " "	61·0
	Assay of original sample raw coal as sent to chemist	" "	14·1
10.	" " " " " "	. . . . . . % sulphur	0·9
11.	" " " " " " .	. Fuel Ratio	1·20
12.	Assay of mixed good and bone coal (5) and (6)	. " "	1·25

Remarks.—This coal is high in innate ash, and contains a medium amount of bone coal high in ash, and also a medium amount of refuse high in ash. It is only moderately well suited to washing, on account of the high innate ash.

TABLE B.

Screen Analysis.

	Maximum Screen MM.	Minimum Screen MM	Mean MM	% of whole sample	% Ash in size
13.	6·34	3·16	4·75	72·0	12·1
14	3·16	1·20	2·18	11·2	12·9
15.	1·20	0·64	0·92	6·9	12·4
16.	0·64	0·30	0·47	3·6	12·6
17.	0·30	0·173	0·24	3·1	14·0
18.	0·173	0·000	0·086	3·2	16·5

Remarks.—This coal shows remarkably low friability, at least so far as the production of dust is concerned, although, apparently, it is not particularly strong in the larger. lumps. In appearance, it is very pitchy looking, and it contains a considerable quantity of yellow resin. The refuse is more friable than the coal, which, on the whole, stands shipment and crushing very well.

TABLE C.

Results of Washing (Details of Sizes).

	Original coal and its products.	Sizes between 1″ and ½″ Total wt. lbs.	Ash. %	Sizes between ½″ and ⅛″ Total wt. lbs.	Ash. %	Sizes under ⅛″ Total wt. lbs.	Ash. %
19.	Original coal	3635	13·4	1702	13·4	498	15·3
20.	Washed coal	3201	9·5	1426	9·3	445	11·3
21.	Refuse—coarse	361	48·0	156	36·3	36	63·9
22.	Hutch product	69	43·7	105	....	....	..
23.	Jig slimes	....	....	12	27·5	....	.
24.	Table slimes	....	....	....	....	13	.

TABLE D.

Results of Washing (Totals).

25.	Original coal	wt. in lbs.	5835	% ash	14·1	% sulphur	0·2
26.	Washed coal	" "	5072	" "	10·0	" "	0·9
27.	Refuse	" "	553	" "	45·8	" "	
28.	Other products	" "	199	" "	....	" "	
29.	Loss	" "	11	" "	....	" "	
30.	Loss in % 0·2.						

TABLE E.

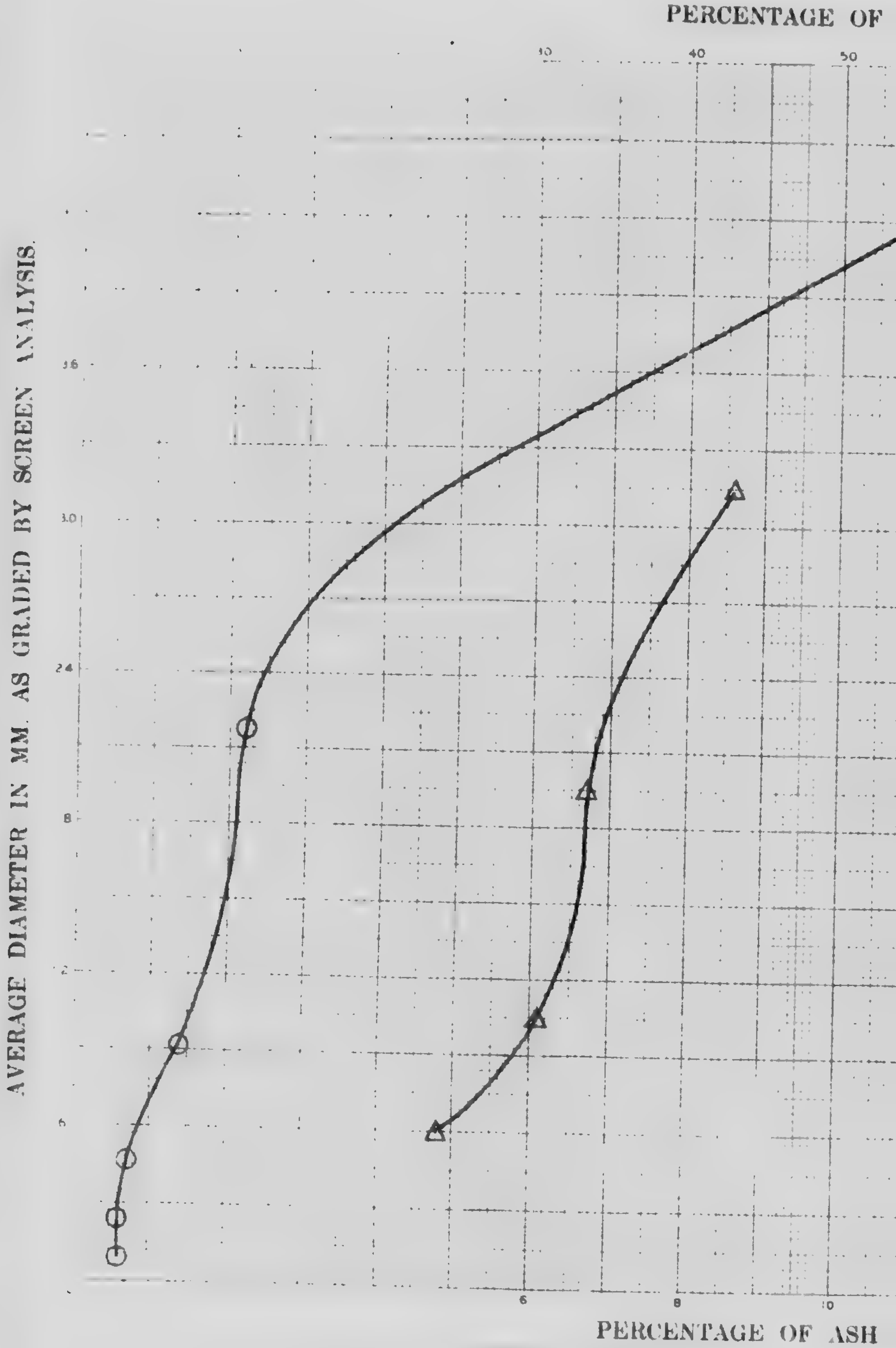
Summary Statement of Effect of Washing on Fuel Values.

31.	Recovery of washed coal, including good bone	%	87·0	Ratio to standard	95·7
32.	Reduction in ash	%	29·1	.. ..	92·0
33.	" " sulphur	%	0·0	.. ..	
34.	Increase in calorific value—calorimeter	%	7·7		
35.	Increase in evaporation under boiler	%	2·3		
36.	Decrease in clinker under boiler	%	25·9		
37.	Fuel ratio of original coal	%	1·20		
38.	" " washed "		1·26		
39.	Calorific value of original coal		6510		
40	" " washed "		7610		

Remarks on Tables C, D, and E.—The trial was fairly successful, the reduction in ash and the recovery of washed coal being nearly as good as could have been expected from the preliminary tests. It is possible, however, that better work, particularly on the fine coal, could be done in a commercial plant.

AVERAGE DIAMETER IN MM AS GRADED BY SCREEN ANALYSIS.

GRAPHIC RECORD OF SIZING

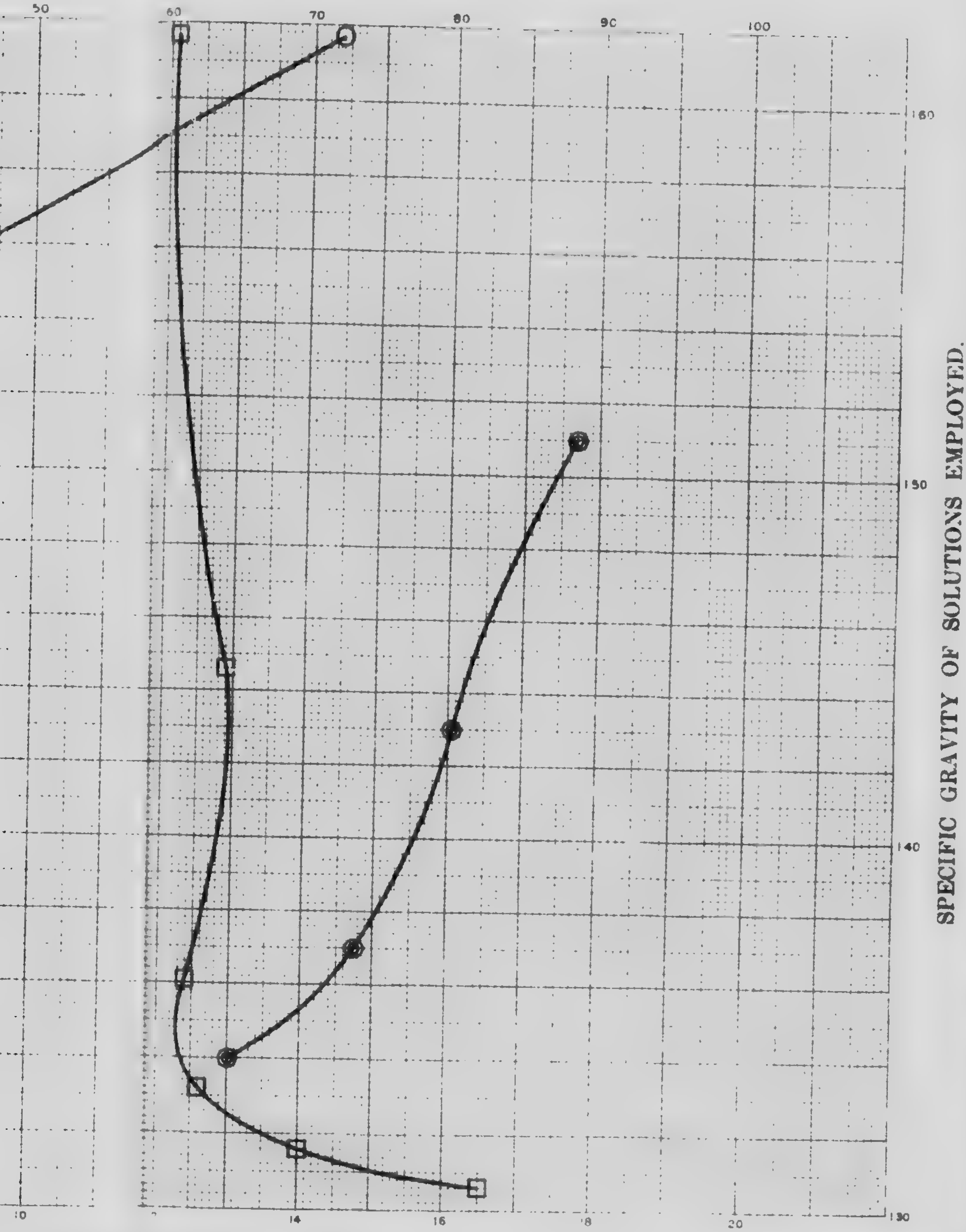


LEGEND: SYMBOLS.

Curve showing the relative quantities of the several sizes.
" " " " " " " " densities.
○ " " " percentage of ash in each of the several sizes.
" " " " material floating at the several den

IZING AND SPECIFIC GRAVITY TESTS.

GE OF SIZE AND OF FLOAT.



F ASH IN SIZE AND IN FLOAT.

COAL No. 22M
APPENDIX I. VOL. III

several densities

WHITEHORSE COAL FIELD, Y.T.

ERRATUM

On the curve diagrams accompanying the tabulated records of each of the coals tested, is the following legend:—

LEGEND: SYMBOLS

Curve showing the relative quantities of the several sizes.
" " " " " " densities.
○ " " " percentage of ash in each of the several sizes.
" " " " " " " material floating at the several densities.

The above legend is incorrect: in each case it should read thus:

Curve showing the relative quantities of the several sizes.
" " "
○ " " " percentage of ash in each of the several sizes.
Δ " " " " " material floating at the several densities.
[illegible]

COAL.—No. EX. 31

Locality.—Whitehorse, Yukon Territory.

Colliery.—Whitehorse Pass and Yukon Railway Co., Tantalus mine.

Sample.—Four sacks from the upper seam of the Tantalus mine, all bone, slate and rock over ½″ having been removed by hand picking. This and samples Exs. 32 and 33 were taken by a member of the permanent staff of the Geological Survey. The conditions of transportation precluded shipping larger samples to Montreal

TABLE A

Specific Gravity Tests.

	Specific gravity of solution.	Float %	Ash in Float %	Sink %	Ash in Sink %
1.	1·530	75·0	9·2	25·0	
2.	1·410	53·0	5·7	46·1	30·0
3.	1·375	37·9	4·5	62·1	24·5
4.	1·325	14·5	2·7	85·5	19·7

The following results are obtained from the above data, and from the chemists results.

5. Good coal, Sp. Gr. under 1·375. . . . . % yield 38·0 % ash 4·5
6. Bone coal, Sp. Gr. 1·375 to 1·55 . . . . " " 40·0 " " 14·2
7. Useful coal—sum of (5) and (6) . . . . " " 78·0 " " 9·5
8. Refuse, Sp. Gr. over 1·55 . . . . " " 22·0 " " 43·5
9. Assay of original sample raw coal as sent to chemist . . . . . . " " 17·0
10. " " " " " " . . . . % sulphur 0·5
11. " " " " " " . . . . Fuel Ratio 2·32
12. Assay of mixed good and bone coal (5) and (6) " "

Remarks.—The coal contains moderate proportions of innate ash, and large proportions of bone and refuse, both low in ash. The amount of total ash in the refuse is considerable, but the loss in washing would be large, on account of the low ash contained in the material to be removed.

TABLE B.

Screen Analysis.

	Maximum Screen MM.	Minimum Screen MM.	Mean MM.	% of whole sample	% Ash in size
13.	6·34	3·16	4·75		
14.	3·16	1·20	2·18		
15.	1·20	0·64	0·92		
16.	0·64	0·30	0·47		
17.	0·30	0·173	0·24		
18.	0·173	0·000	0·806		

Remarks.—No screen analysis was made of these samples.

TABLE C

Results of Washing (Details of Sizes).

	Original coal and its products.	Sizes between 1" and ½" Total wt. lbs.	Ash. %	Sizes between ½" and ⅛" Total wt. lbs.	Ash. %	Sizes under ⅛" Total wt. lbs.	Ash. %
19.	Original coal						
20.	Washed coal	This sample was washed on a small scale only.					
21.	Refuse—coarse						
22	Hutch product						
23	Jig slimes						
24	Table slimes						

TABLE D.

Results of Washing (Totals).

25.	Original coal	wt. in lbs.	115	% ash	17·0	% sulphur	0·5
26.	Washed coal	" "	93	" "	13·8	" "	0·5
27.	Refuse	" "	17	" "	43·5	" "	
28.	Other products	" "	....	" "	....	" "	
29.	Loss	" "	5·0	" "		" "	
30.	Loss in % 4·3.						

TABLE E.

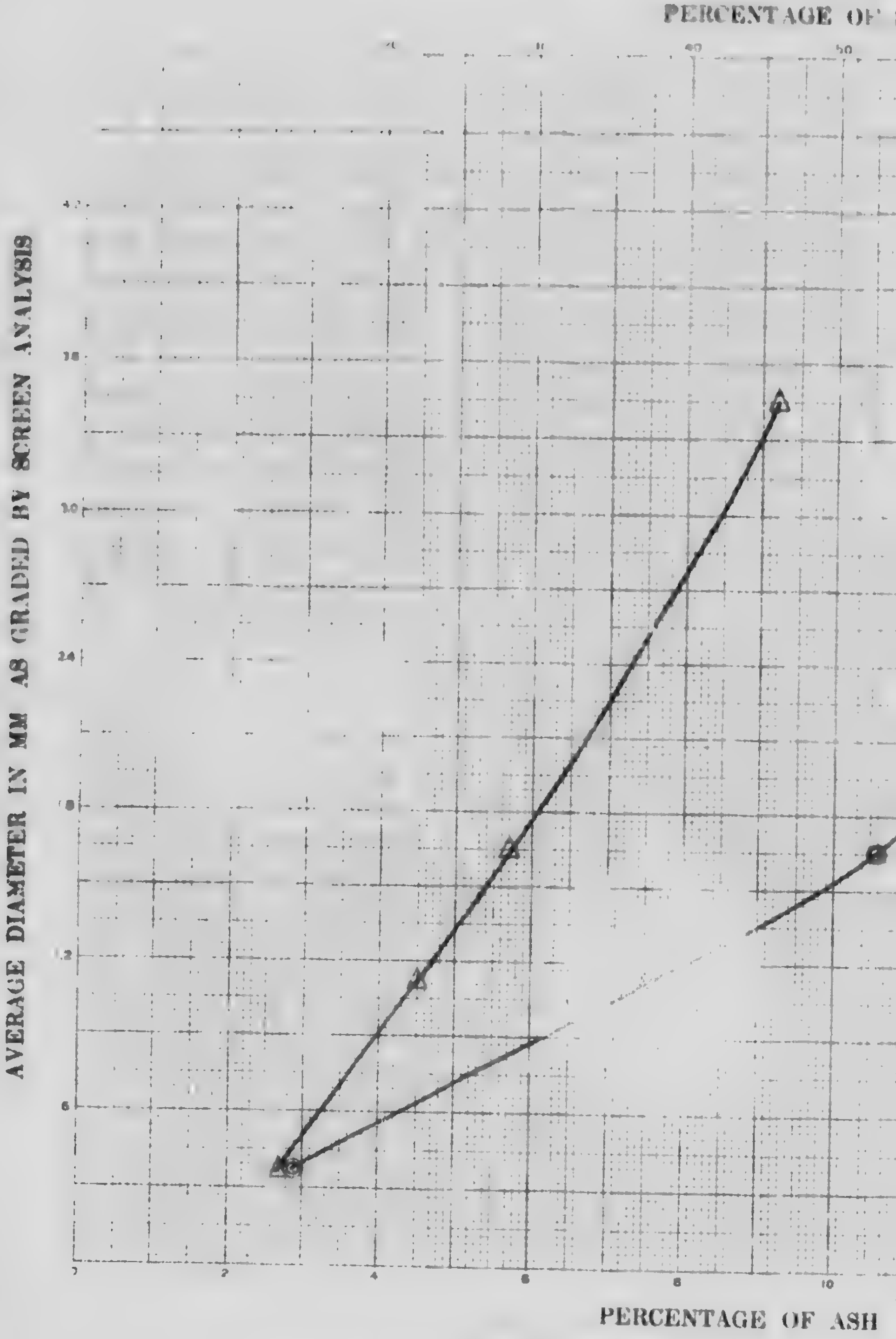
Summary Statement of Effect of Washing on Fuel Values.

31.	Recovery of washed coal, including good bone	%	81·0	Ratio to standard	103·8
32.	Reduction in ash	%	18·8	" "	68·8
33.	" " sulphur	%	....	" "	.
34.	Increase in calorific value—calorimeter	%	6·1		
35.	Increase in evaporation under boiler	%	....		
36.	Decrease in clinker under boiler	%	....		
37.	Fuel ratio of original coal		2·32		
38.	" " washed "		2·28		
39.	Calorific value of original coal		6700		
40.	" " washed "		7110		

Remarks on Tables C, D, and E.—Owing to the very small size of the sample, it was necessary to wash this coal on a small model washer, and the results were not satisfactory, probably due to the impossibility of skimming the jig beds accurately on so small a scale. As a result, the ash, particularly in the coal between ⅜" and ₁⁄₃₂", is too high and the total recovery is too great. A much better result could, unquestionably, be obtained in a commercial washer, although, even at best, the coal is not easy to deal with.

AVERAGE DIAMETER IN MM AS GRADED BY SCREEN ANALYSIS.

GRAPHIC RECORD OF SIZING

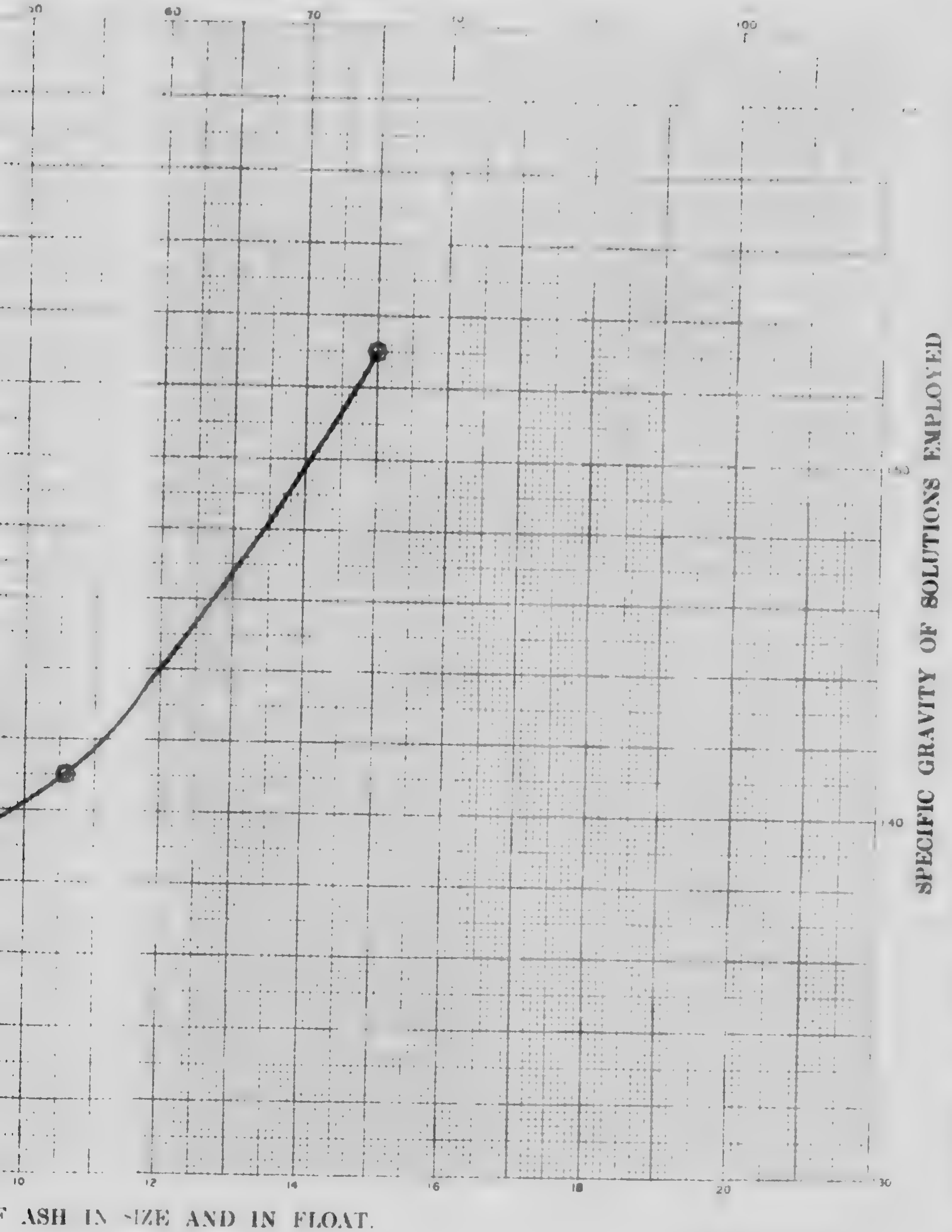


LEGEND: SYMBOLS.

○ Curve showing the relative quantities of the several sizes.
△ " " " " " " " densities.
□ " " " percentage of ash in each of the several sizes.
⊙ " " " " " " " material floating at the several de

ZING AND SPECIFIC GRAVITY TESTS

GE OF SIZE AND OF FLOAT.



COAL No. Ex. 31
APPENDIX I, VOL. III

several densities

COAL.—No. EX. 32.

Locality.—Whitehorse, Yukon Territory.

Colliery.—Whitehorse Pass and Yukon Railway Co., Tantalus mine.

Sample.—Four sacks from the middle seam of the Tantalus mine, all bone, slate, and rock over ½" having been removed by hand picking. This and samples Exs. 31 and 33 were taken by a member of the permanent staff of the Geological Survey. The conditions of transportation precluded shipping a large sample to Montreal.

TABLE A.

Specific Gravity Tests.

	Specific gravity of solution.	Float %	Ash in Float %	Sink %	Ash in Sink %
1.	1·545	72·4	11·6	27·6	46·4
2.	1·415	38·0	7·1	62·0	30·0
3.	1·375	23·1	5·2	76·9	27·0
4.	1·325	5·1	2·5	94·9	22·6

The following results are obtained from the above data, and from the chemists results.

5.	Good coal, Sp. Gr. under 1·375	% yield	23·0	% ash	5·2
6.	Bone coal, Sp. Gr. 1·375 to 1·55	" "	50·5	" "	14·7
7.	Useful coal—sum of (5) and (6)	" "	73·5	" "	11·7
8.	Refuse, Sp. Gr. over 1·55	" "	26·5	" "	46·8
9.	Assay of original sample raw coal as sent to chemist			" "	19·2
10.	" " " " " "			% sulphur	0·5
11.	" " " " " "			Fuel Ratio	2·03
12.	Assay of mixed good and bone coal (5) and (6)			" "	...

Remarks.—This coal has a high innate ash, and very large proportions of bone coal and refuse, low in ash. It can be easily washed to about 15 per cent and perhaps with advantage to 11 per cent : below this, the loss would probably be excessive.

TABLE B.

Screen Analysis.

	Maximum Screen MM.	Minimum Screen MM.	Mean MM.	% of whole sample	% Ash in size
13.	6·34	3·16	4·75		
14.	3·16	1·20	2·18		
15.	1·20	0·64	0·92		...
16.	0·64	0·30	0·47		
17.	0·30	0·173	0·24		...
18.	0·173	0·000	0·086		

Remarks.—No screen analysis was made of this coal.

TABLE C.

Results of Washing (Details of Sizes.)

	Original coal and its products.	Sizes between 1″ and ½″ Total wt. lbs.	Ash. %	Sizes between ½″ and ¼″ Total wt. lbs.	Ash. %	Sizes under ¼″ Total wt. lbs.	Ash. %
19.	Original coal						
20.	Washed coal						
21.	Refuse—coarse	This coal was washed on a very small scale only.					
22.	Hutch product						
23.	Jig slimes						
24.	Table slimes						

TABLE D.

Results of Washing (Totals).

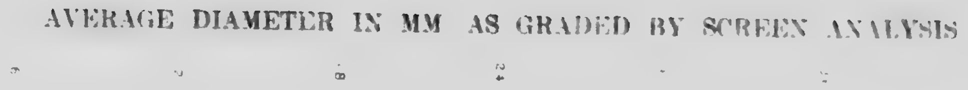
25.	Original coal	wt. in lbs.	149	% ash	19·2	% sulphur	0·5
26.	Washed coal	" "	114	" "	14·0	" "	0·4
27.	Refuse	" "	32	" "	45·8	" "	
28.	Other products	" "	..	" "		" "	
29.	Loss	" "	3	" "		" "	
30.	Loss in % 2·0						

TABLE E.

Summary Statement of Effect of Washing on Fuel Values.

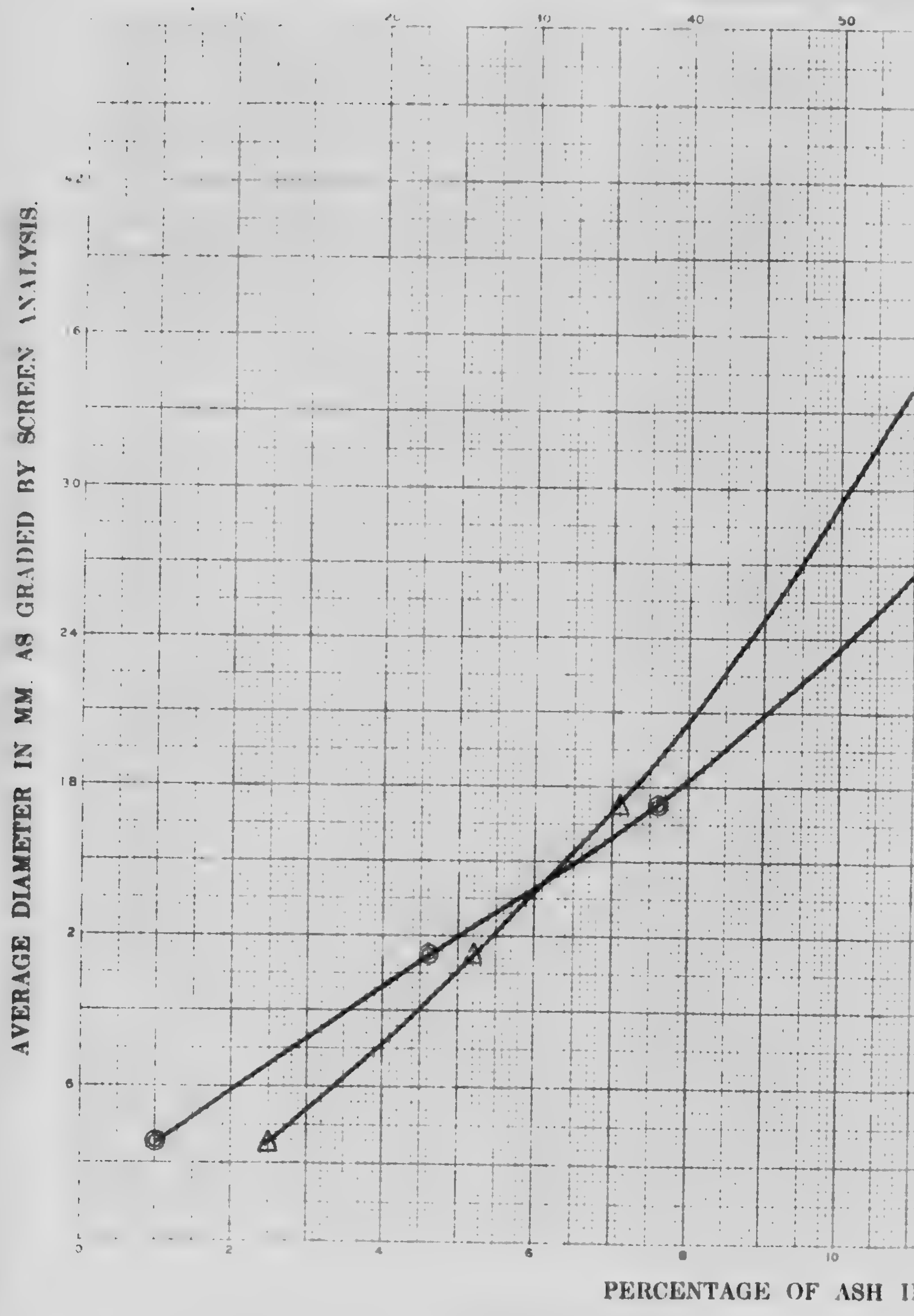
31.	Recovery of washed coal, including good bone	%	76·5	Ratio to standard	104·0
32.	Reduction in ash	%	27·1	" "	83·5
33.	" " sulphur	%	20·0	" "	
34.	Increase in calorific value—calorimeter	%	12·0		
35.	Increase in evaporation under boiler	%			
36.	Decrease in clinker under boiler	%	...		
37.	Fuel ratio of original coal		2·03		
38.	" " washed "		2·35		
39.	Calorific value of original coal		6310		
40	" " washed "		7070		

Remarks on Tables C, D, and E.—This trial was more satisfactory than that of the Upper seam, Ex. 31, and, on the whole, was as good as can be expected from so small a quantity of material.



AVERAGE DIAMETER IN MM AS GRADED BY SCREEN ANALYSIS
6
.8
2.4

GRAPHIC RECORD OF SIZING



LEGEND: SYMBOLS.

○ Curve showing the relative quantities of the several sizes.

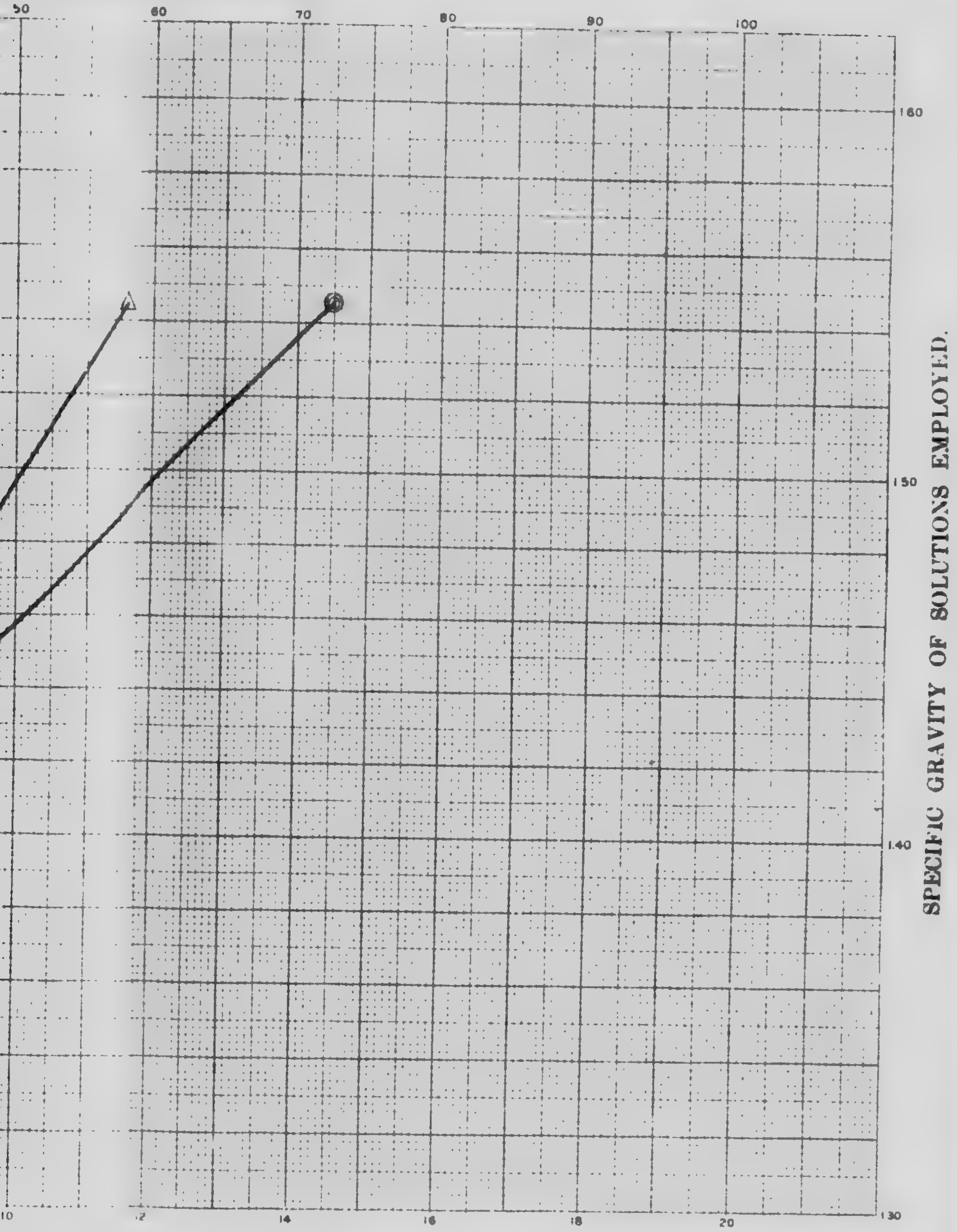
△ " " " " " " " densities.

⊖ " " " percentage of ash in each of the several sizes.

O " " " " " " " material floating at the several dens

ZING AND SPECIFIC GRAVITY TESTS.

E OF SIZE AND OF FLOAT.



ASH IN SIZE AND IN FLOAT.

COAL No Ex. 32
APPENDIX I, VOL. III

veral densities

COAL.—No. EX. 33.

Locality.—Whitehorse, Yukon Territory.

Colliery.—Whitehorse Pass and Yukon Railway Co., Tantalus mine.

Sample.—Four sacks from the lower seam of the Tantalus mine all bone, slate, and rock over ½″ having been removed by hand picking. This and samples Exs. 31 and 32 were taken by a member of the permanent staff of the Geological Survey. The conditions of transportation precluded shipping a larger sample to Montreal.

TABLE A

Specific Gravity Tests.

	Specific gravity of solution.	Float %	Ash in Float %	Sink %	Ash in Sink %
1.	1·560	78·4	8·6	21·6	40·8
2.	1·410	66·0	6·5	34·0	34·6
3.	1·375	52·8	5·3	47·2	26·8
4	1·325	29·6	3·6	70·4	20·0

The following results are obtained from the above data, and from the chemists results:—

5. Good coal, Sp. Gr. under 1·375 ... % of sample [illegible] % ash [illegible]
6. Bone coal, Sp. Gr. 1·375 to 1·55 ... " " 23·7 " " 15·[illegible]
7. Useful coal—sum of (5) and (6) ... " " 77·7 " " 8·[illegible]
8. Refuse, Sp. Gr. over 1·55 ... " " 22·3 " " 40
9. Assay of original sample raw coal as sent to chemist ... % ash 16·2
10. " " " " " " ... % sulphur 0·5
11. " " " " " " ... Fuel Ratio 2·02
12. Assay of mixed good and bone coal (5) and (6) ... [illegible]

Remarks.—This seam has a larger proportion of good coal and less bone than the other seams tested. The refuse, also, is low in ash. It could be improved by washing, but not to a very great extent without heavy loss.

TABLE B

Screen Analysis.

	Maximum Screen MM.	Minimum Screen MM.	Mean MM.	% of whole sample	% Ash in size
13.	6·34	3·16	4·75		
14.	3·16	1·20	2·18		
15.	1·20	0·64	0·92		
16	0·64	0·30	0·47		
17.	0·30	0·173	0·23		
18.	0·173	0·000	0·086		

Remarks.—No screen analysis was made of this coal

TABLE C.

Results of Washing (Details of Sizes).

Original coal and its products.	Sizes between 1" and ½" Total wt. lbs.	Ash. %	Sizes between ½" and ¼" Total wt. lbs.	Ash. %	Sizes under ¼" Total wt. lbs.	Ash. %
19. Original coal						
20. Washed coal						
21. Refuse—coarse						
22. Hutch product	This sample was washed on a very small scale.					
23. Jig slimes						
24. Table slimes						

TABLE D.

Results of Washing (Totals).

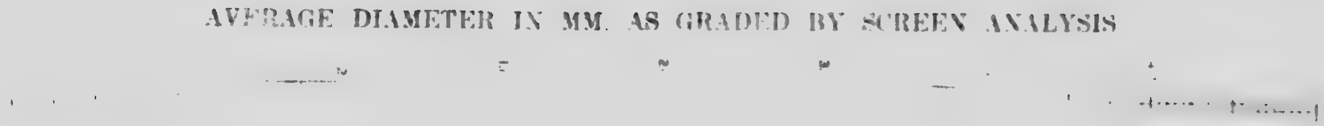
25. Original coal						
26. Washed coal	wt. in lbs.	154	% ash	16·2	% sulphur	0·5
27. Refuse	" "	128	" "	12·7	" "	0·5
28. Other products	" "	21	" "	50·1	" "	
29. Loss	" "		" "		" "	
30. Loss in % 3·2	" "	5	" "		" "	

TABLE E.

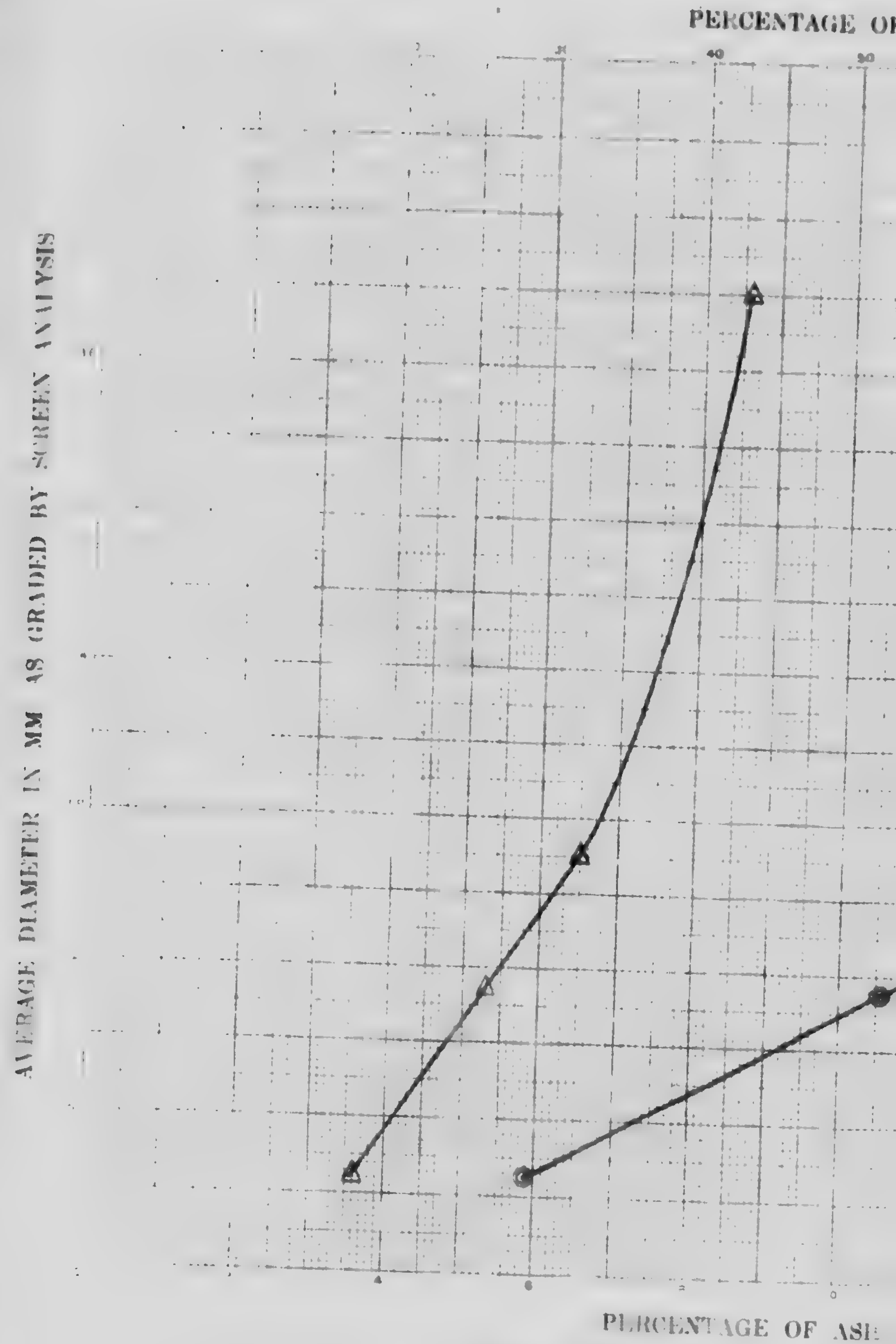
Summary Statement of Effect of Washing on Fuel Values.

31. Recovery of washed coal, including good bone	%			
32. Reduction in ash		83·0	Ratio to standard	106·8
33. " " sulphur	%	21·6	" "	66·9
34. Increase in calorific value—calorimeter	%	0·0	" "	
35. Increase in evaporation under boiler	%	6·2		
36. Decrease in clinker under boiler	%			
37. Fuel ratio of original coal	%			
38. " " washed "		2·02		
39. Calorific value of original coal		2·11		
40. " " washed "		6790		
		7210		

Remarks on Tables C, D, and E.—This trial was not satisfactory, owing to conditions already explained under Ex. 31. If the quantity had been sufficient for a repetition, it would have been possible to get better results by wasting a little more refuse. In practice this, unquestionably, would be done.


AVERAGE DIAMETER IN MM. AS GRADED BY SCREEN ANALYSIS

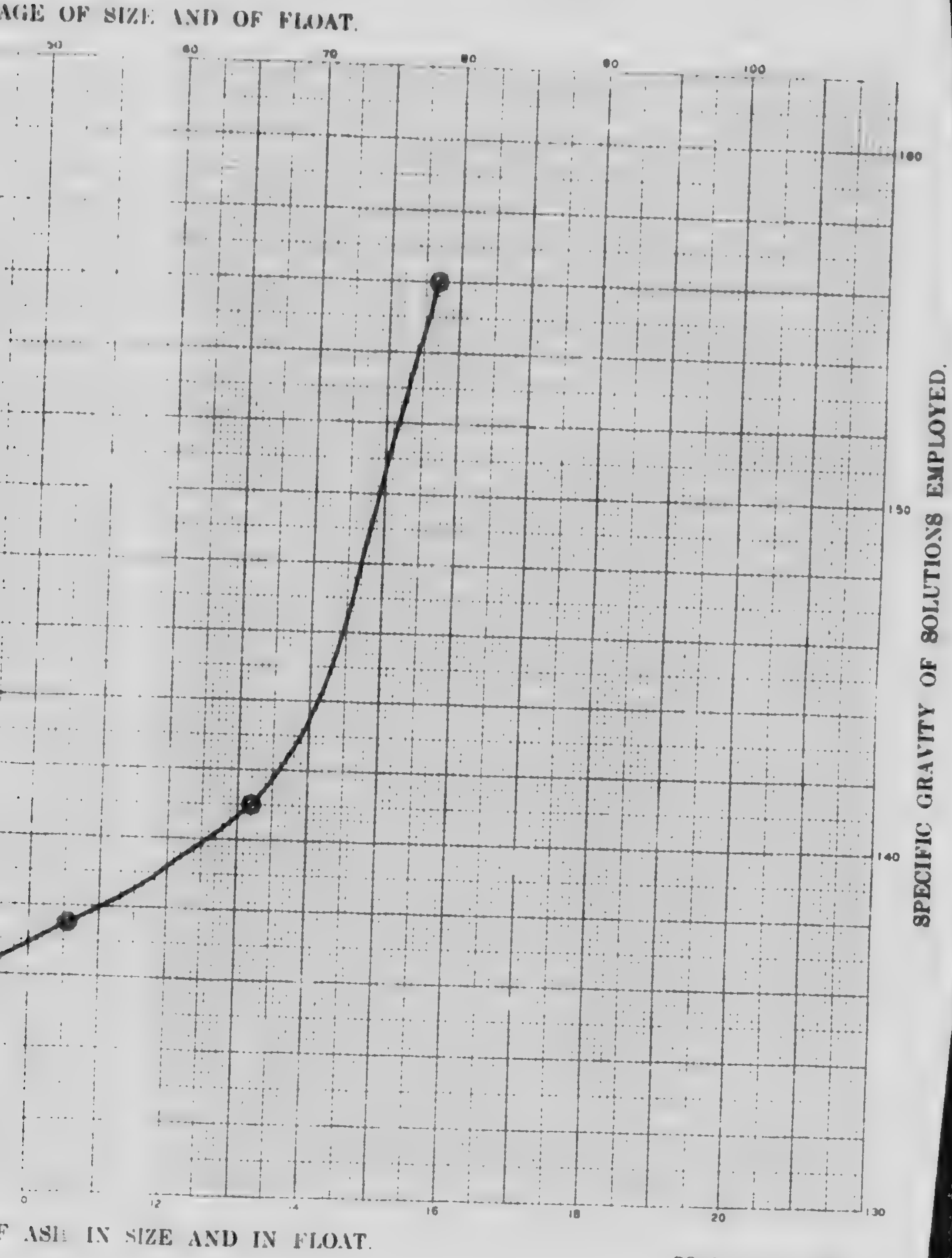
GRAPHIC RECORD OF SIZIN



LEGEND: SYMBOLS.

Curve showing the relative quantities of the several sizes.
" " " " " " " " densities.
" " " percentage of ash in each of the several sizes.
" " " " material floating at the several de

SIZING AND SPECIFIC GRAVITY TESTS.

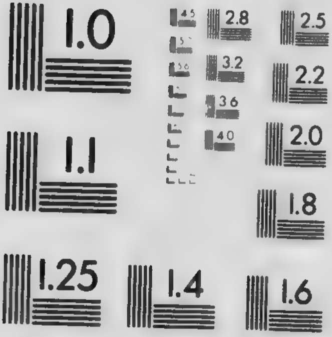


COAL No. Ex. 33
APPENDIX I, VOL. III

everal [illegible]

MICROCOPY RESOLUTION TEST CHART

ANSI and ISO TEST CHART No. 2



APPLIED IMAGE Inc

VANCOUVER ISLAND.

SOUTHERN COAL FIELD.

ERRATUM

On the curve diagrams accompanying the tabulated records of each of the coals tested is the following legend:—

LEGEND: SYMBOLS

○ Curve showing the relative quantities of the several sizes
△ " " " " " " " " densities
□ " " " percentage of ash in each of the several sizes
◎ " " " " " " " material floating at the several densities

The above legend is incorrect; in each case it should read thus:—

○ Curve showing the relative quantities of the several sizes
□ " " " percentage of ash in each of the several sizes
◎ " " " " " material floating at the several densities
△ " " " " ash in

COAL.—No. 20.

Locality.—Extension, Vancouver island, B.C.

Colliery.—Wellington Colliery Co., Extension mine

Sample.—One hundred and twenty-eight bags, weighing 10 tons, from the Wellington seam, the thickness of which varies from 4 to 14 feet. The sample was taken when numerous sections of the mine were being operated. The working extends 2½ miles east and west of the main tunnel, which, itself, is one mile long. The sample is of lump coal, which had passed over a 1½″ screen, and had been hand picked by Chinese labourers. Sampled April 8, 1908.

TABLE A

Specific Gravity Tests.

	Specific gravity of solution.	Float %	Ash in Float %	Sink %	Ash in Sink %
1.	1·520	91·5	6·5	8·5	43·2
2.	1·430..........	89·8	6·0	10·2	
3.	1·370.....	85·5	5·4	14·7	34·5
4.	1·340..........	80·0	5·0	20·0	27·5

The following results are obtained from the above data, and from the chemists results :—

5.	Good coal, Sp. Gr. under 1·375	% yield	86·0	% ash	5·5
6.	Bone coal, Sp. Gr. 1·375 to 1·55	" "	6·0	" "	22·7
7.	Useful coal—sum of (5) and (6)	" "	92·0	" "	6·5
8.	Refuse, Sp. Gr. over 1·55	" "	8·0	" "	45·0
9.	Assay of original sample raw coal as sent to chemist			" "	10·1
10.	" " " " " "			% sulphur	0·4
11.	" " " " " "			Fuel Ratio	1·24
12.	Assay of mixed good and bone coal (5) and (6)			" "	1·33

Remarks.—This coal could be appreciably improved by washing, but it is good enough for ordinary use as fuel without it, and the improvement due to washing would probably not justify treatment. It is probable, however, that it will ultimately pay to wash the screenings, which carry more ash than the lump coal.

TABLE B

Screen Analysis.

	Maximum Screen MM.	Minimum Screen MM.	Mean MM.	% of whole sample	% Ash in size
13.	6·34	3·16	4·75	42·8	9·8
14.	3·16	1·20	2·18	23·7	8·5
15.	1·20	0·64	0·92	13·7	8·4
16.	0·64	0·30	0·47	7·5	9·0
17.	0·30	0·173	0·24	6·2	9·5
18.	0·175	0·090	0·086	[illegible]	12·5

Remarks.—This coal is weaker than the Nanaimo coal, Nos. 17 and 18, and the ash-bearing material is also weaker. The coal is not, however, really friable, and it stands shipment and crushing fairly well, making only a medium proportion of fines.

TABLE C.

Results of Washing (Details of Sizes).

	Original coal and its products.	Sizes between 1″ and ½″ Total wt. lbs.	Ash. %	Sizes between ½″ and ⅛″ Total wt. lbs.	Ash. %	Sizes under ⅛″ Total wt. lbs	Ash. %
19.	Original coal ..						
20.	Washed coal.						
21.	Refuse—coarse..	This coal was not washed.					
22.	Hutch product..						
23.	Jig slimes. . . .						
24.	Table slimes						

TABLE D.

Results of Washing (Totals).

25. Original coal ....wt. in lbs. .... % ash .... % sulphur ....
26. Washed coal........................ " " .... " " .... " " ....
27. Refuse............................ " " .... " " .... " " ....
28. Other products.................... " " .... " " .... " " ....
29. Loss............... " " ... " " ... " " ....
30. Loss in %

TABLE E.

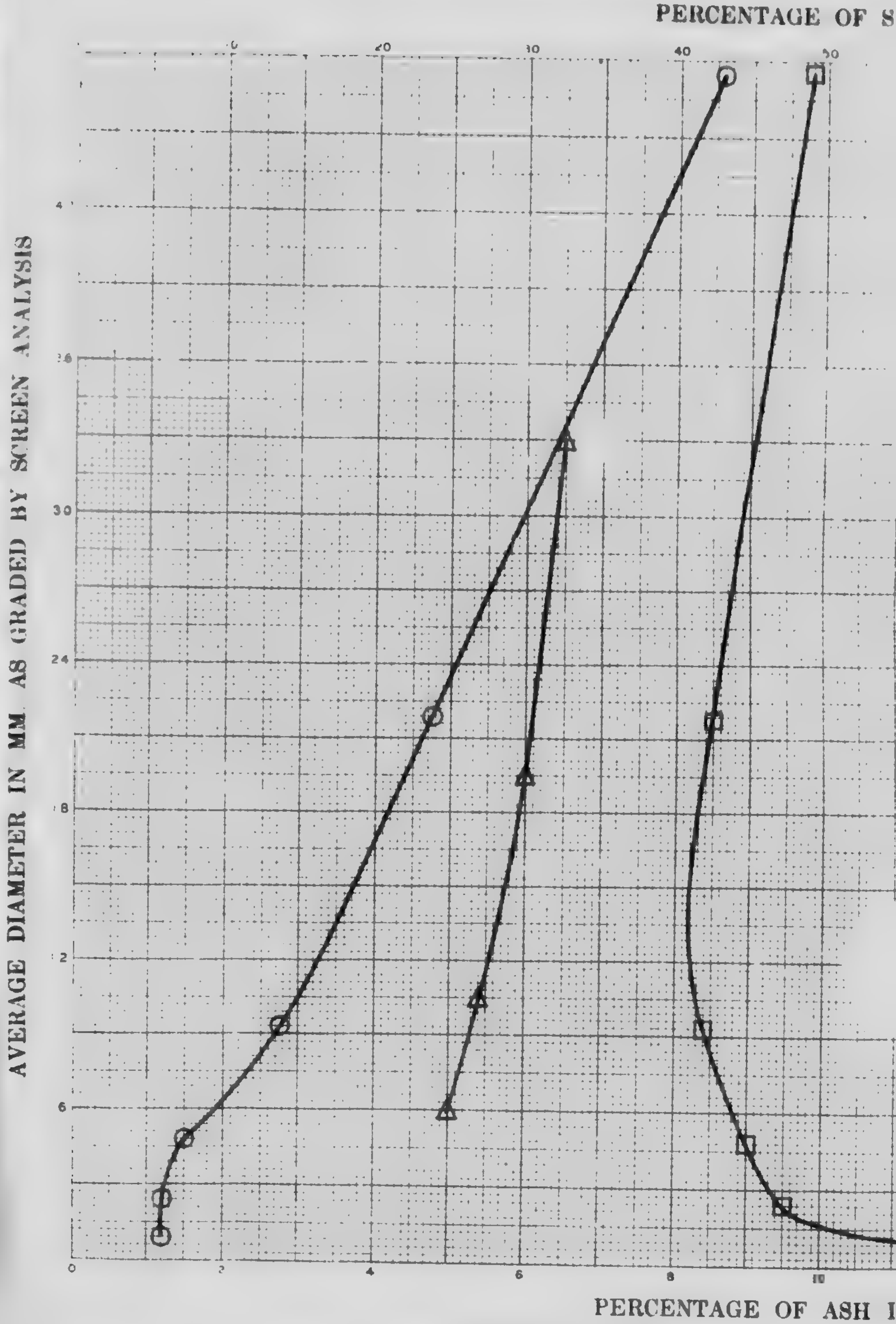
Summary Statement of Effect of Washing on Fuel Values.

31. Recovery of washed coal, including good bone....% .... Ratio to standard
32. Reduction in ash..............................% .... " "
33. " " sulphur.........................% .... " " .
34. Increase in calorific value—calorimeter..........% ....
35. Increase in evaporation under boiler............% ....
36. Decrease in clinker under boiler................% ...
37. Fuel ratio of original coal..... .. ..
38. " " washed " ....
39. Calorific value of original coal.. ....
40. " " washed " ... .

Remarks on Tables C, D, and E.—The results of preliminary tests were such that it was not considered necessary to wash this coal.

AVERAGE DIAMETER IN MM. AS GRADED BY SCREEN ANALYSIS.
.6
1.2
1.8
2.4
3.0
3.6
4.2

GRAPHIC RECORD OF SIZING A

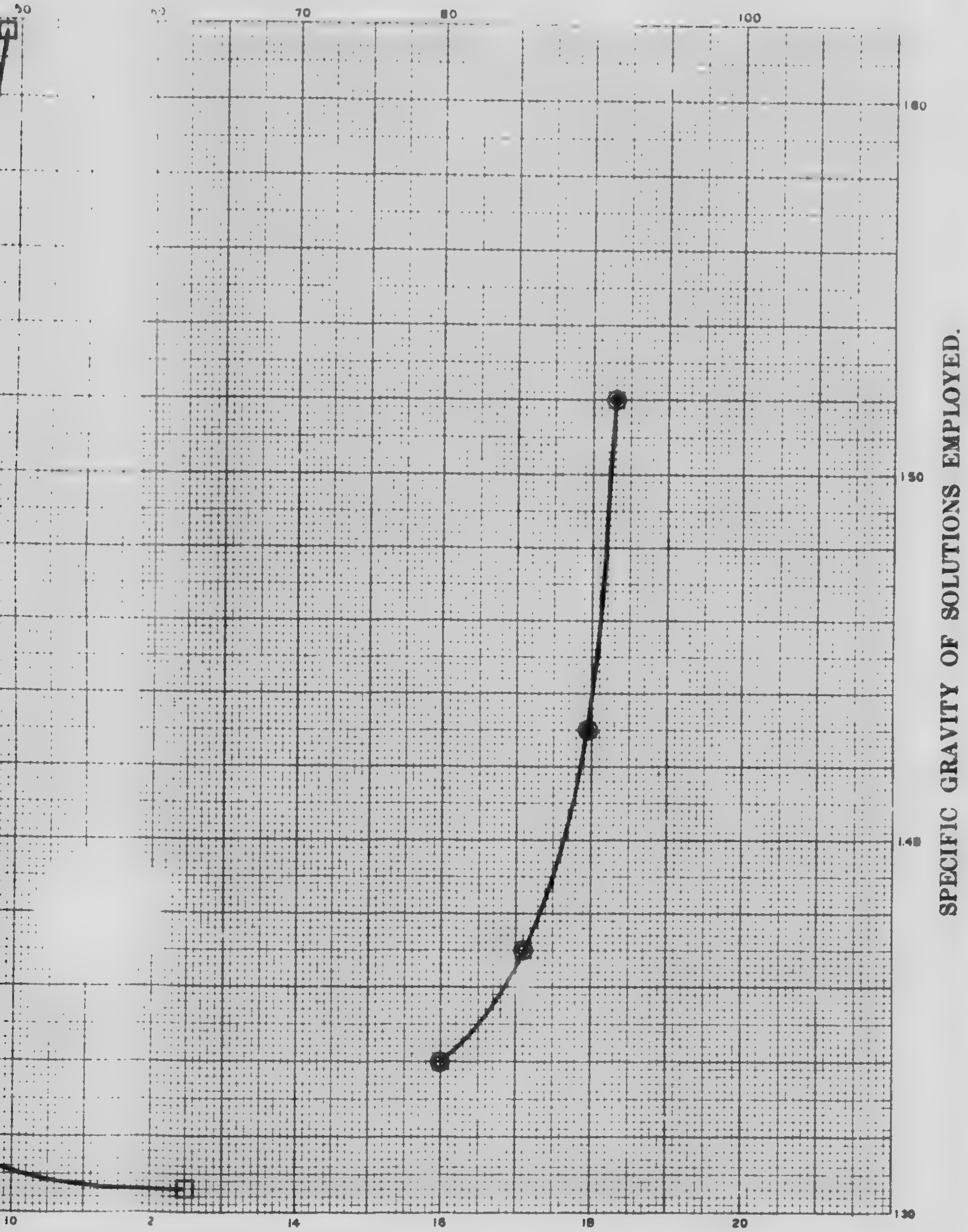


LEGEND: SYMBOLS.

Curve showing the relative quantities of the several sizes.
" " " " " " " " densities.
□ " " " percentage of ash in each of the several sizes.
○ " " " " " " " material floating at the several den

ZING AND SPECIFIC GRAVITY TESTS.

E OF SIZE AND OF FLOAT.



ASH IN SIZE AND IN FLOAT.

COAL No. 20
APPENDIX I, VOL. III

everal densities

COAL.—No. 18.

Locality.—Nanaimo, Vancouver island, B.C.

Colliery.—Western Fuel Company, No. 1 Main slope, upper seam

Sample.—One hundred and forty-five bags from the upper seam, or south side coal, taken from workings on the diagonal slope off No. 1 main shaft. The sample was of lump coal which had passed over a 2″ screen and a hand picking table, with Chinese workmen. Sampled April 4 1908.

TABLE A

Specific Gravity Tests.

	Specific gravity of solution.	Float %	Ash in Float %	Sink %	Ash in Sink %
1	1·520	95·2	8·0	4·8	45·9
2.	1·410	89·0	7·1	11·0	32·0
3.	1·370	86·0	6·8	14·0	26·8
4.	1·310	63·8	5·4	37·2	16·8

The following results are obtained from the above data and from the chemists results :—

5.	Good coal, Sp. Gr. under 1·375	% yield	86·5	% ash	6·8
6.	Bone coal, Sp. Gr. 1·375 to 1·55	" "	10·0	" "	20·0
7.	Useful coal—sum of (5) and (6)	" "	96·5	" "	8·1
8.	Refuse, Sp. Gr. over 1·55	" "	3·5	" "	52·5
9.	Assay of original sample raw coal as sent to chemist			" "	10·3
10.	" " " " " "			% sulphur	0·9
11.	" " " " " "			Fuel Ratio	1·18
12.	Assay of mixed good and bone coal (5) and (6)			" "	1·18

Remarks.—The innate ash in the coal is high. The bone is low in amount and has a medium quantity of ash. The refuse, also, is low in amount, with fairly low ash. The coal, therefore, will not be materially improved by washing.

TABLE B

Screen Analysis.

	Maximum Screen MM.	Minimum Screen MM	Mean MM.	% of whole sample	% Ash in size
13.	6·34	3·16	3·78	70·6	10·3
14.	3·16	1·20			
15.	1·20	0·64	0·92	9·3	9·9
16	0·64	0·30	0·47	6·0	10·1
17.	0·30	0·173	0·24	7·7	[illegible]
18.	0·173	0·000	0·086	4·4	13·2

Remarks.—The screen analysis is very similar to that of the coal from the lower seam, but the ash-bearing material and the coal have nearly the same strength. The coal is by no means friable, and stands shipment and crushing well.

TABLE C

Results of Washing (Details of Sizes).

	Original coal and its product	Sizes between 1" and ½" Total wt lbs	Ash %	Sizes between ½" and ¼" Total wt. lbs	Ash %	Sizes under ¼" Total wt lbs	Ash %
19	Original coal						
20	Washed coal						
21	Refuse—coarse..	This coal was not washed					
22	Hutch product						
23	Jig slimes						
24	Table slimes						

TABLE D.

Results of Washing (Totals).

25.	Original coal	wt. in lbs	% ash	% sulphur ..
26.	Washed coal.	" "	" "	" " ...
27.	Refuse.........	" "	" "	" " ..
28.	Other products.	" "	" "	" " ..
29.	Loss..	" "	" "	" "
30.	Loss in %			

TABLE E.

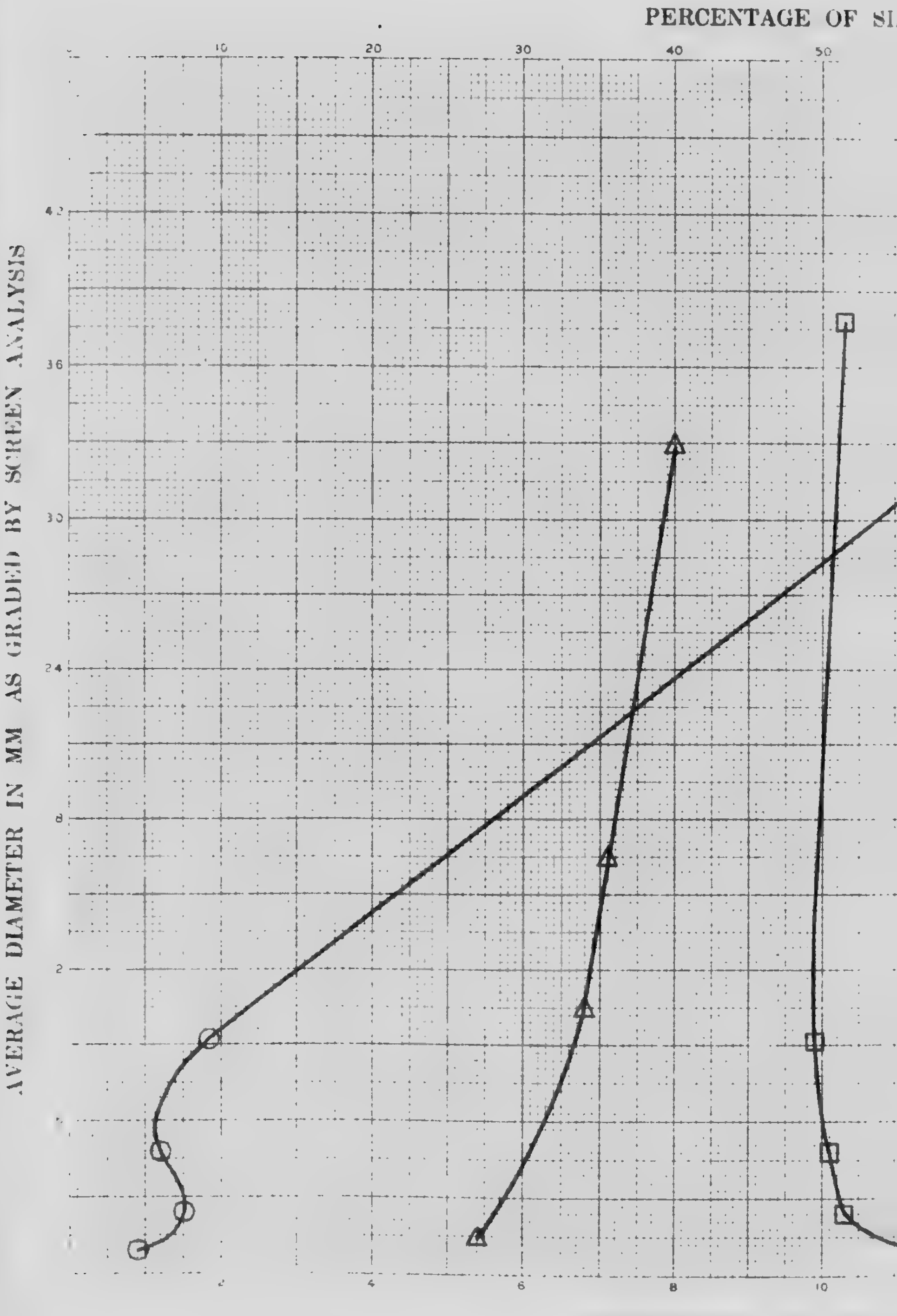
Summary Statement of Effect of Washing on Fuel Values.

31.	Recovery of washed coal, including good bone.	%	Ratio to standard
32.	Reduction in ash.......	%	" "
33.	" " sulphur.	%	" "
34.	Increase in calorific value—calorimeter	%	
35.	Increase in evaporation under boiler..	%	
36.	Decrease in clinker under boiler..	%	
37.	Fuel ratio of original coal........	..	
38.	" " washed "	..	
39.	Calorific value of original coal......	...	
40.	" " washed " ...	...	

Remarks on Tables C, D, and E. The results of the preliminary tests were such that it was not considered necessary to wash this coal.

AVERAGE DIAMETER IN MM. AS GRADED BY SCREEN ANALYSIS

GRAPHIC RECORD OF SIZING

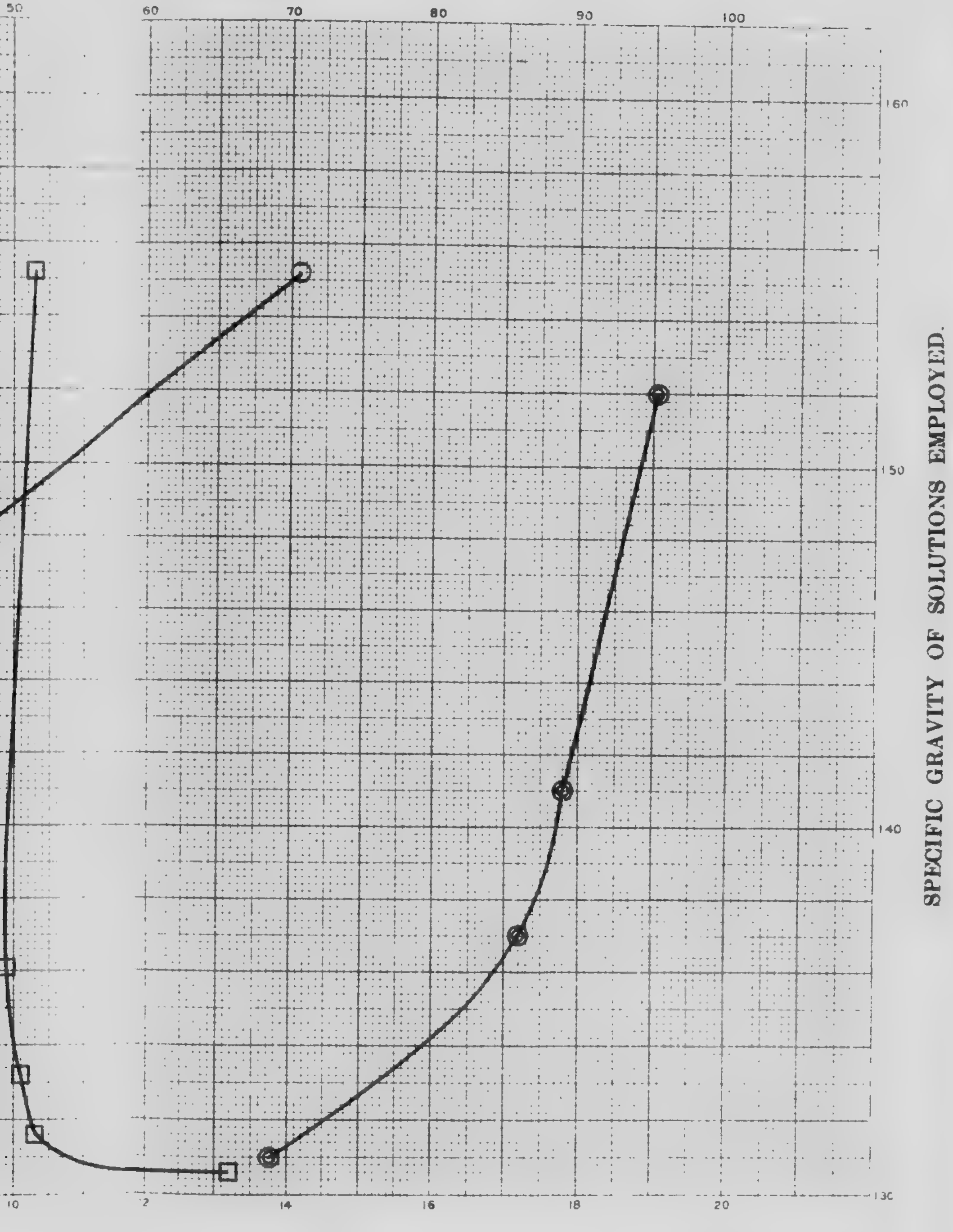


LEGEND: SYMBOLS.

○ Curve showing the relative quantities of the several sizes.
△ " " " " " " " " densities.
□ " " " percentage of ash in each of the several sizes.
◎ " " " " " " " material floating at the several den

ING AND SPECIFIC GRAVITY TESTS.

OF SIZE AND OF FLOAT.



COAL No. 18
APPENDIX I, VOL. III

everal densities.

COAL.—No. 17.

Locality.—Nanaimo, Vancouver island, B.C.

Colliery.—Western Fuel Company, No. 1, Main lower seam

Sample.—One hundred and thirty-four bags taken from No. 1 North Level working, about 1½ miles from the bottom of No. 1 shaft, about 2,000 feet from Protection Island shaft. The sample was of lump coal, which had passed over a 2″ screen and a hand picking table, with Chinese workmen. Sampled April 6, 1908.

TABLE A.

Specific Gravity Tests.

	Specific gravity of solution.	Float %	Ash in Float %	Sink %	Ash in Sink %
1.	1·550	95·8	9·3	4·2	59·4
2.	1·445	93·6	9·2	6·4	39·4
3.	1·370	84·2	8·0	15·8	27·9
4.	1·325	57·9	7·0	42·1	16·8

The following results are obtained from the above data, and from the chemists results :—

5. Good coal, Sp. Gr. under 1·375 . . . % yield 84·7 % ash 8·1
6. Bone coal, Sp. Gr. 1·375 to 1·55 . . . " " 11·1 " " 18·6
7. Useful coal—sum of (5) and (6) . . . " " 95·8 " " 9·3
8. Refuse, Sp. Gr. over 1·55 . . . " " 4·2 " " 59·4
9. Assay of original sample raw coal as sent to chemist . . . 11·9
10. " " " " " . . . % sulphur 1·3
11. " " " " " . . . Fuel Ratio 1·12
12. Assay of mixed good and bone coal (5) and (6) . . . " " 1·16

Remarks.—This coal has an exceptionally high proportion of innate ash, and a rather low proportion of bone of medium quality. The refuse is small, but high in ash, and can easily be removed by washing, but the improvement would scarcely be sufficient to justify the operation under present conditions.

TABLE B.

Screen Analysis.

	Maximum Screen MM.	Minimum Screen MM.	Mean MM.	% of whole sample	% Ash in [illegible]
13	6·34	3·16	3·78	69·8	11·8
14.	3·16	1·20			
15.	1·20	0·64	0·92	15·8	11·0
16.	0·64	0·30	0·47	7·7	11·1
17.	0·30	0·173	0·24	8·3	12·8
18.	0·173	0·000	0·086	4·4	15·8

Remarks.—The percentage of very fine coal is small. The ash-bearing material is evidently more friable than the coal, which is hard and stands shipment and fine crushing without producing very much dust.

TABLE C.

Results of Washing (Details of Sizes).

	Original coal and its products.	Sizes between 1" and ½" Total wt. lbs.	Ash. %	Sizes between ½" and ⅛" Total wt. lbs.	Ash. %	Sizes under ⅛" Total wt. lbs.	Ash %
19.	Original coal	This coal was not washed.					
20.	Washed coal						
21.	Refuse—coarse						
22.	Hutch product						
23.	Jig slimes						
24.	Table slimes						

TABLE D.

Results of Washing (Totals).

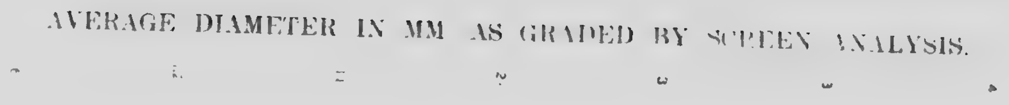
25.	Original coal	wt. in lbs.	% ash	% sulphur ....
26.	Washed coal	" "	" "	" " ....
27.	Refuse	" "	" "	" " ....
28.	Other products	" "	" "	" " ....
29.	Loss	" "	" "	" " ....
30.	Loss in %			

TABLE E.

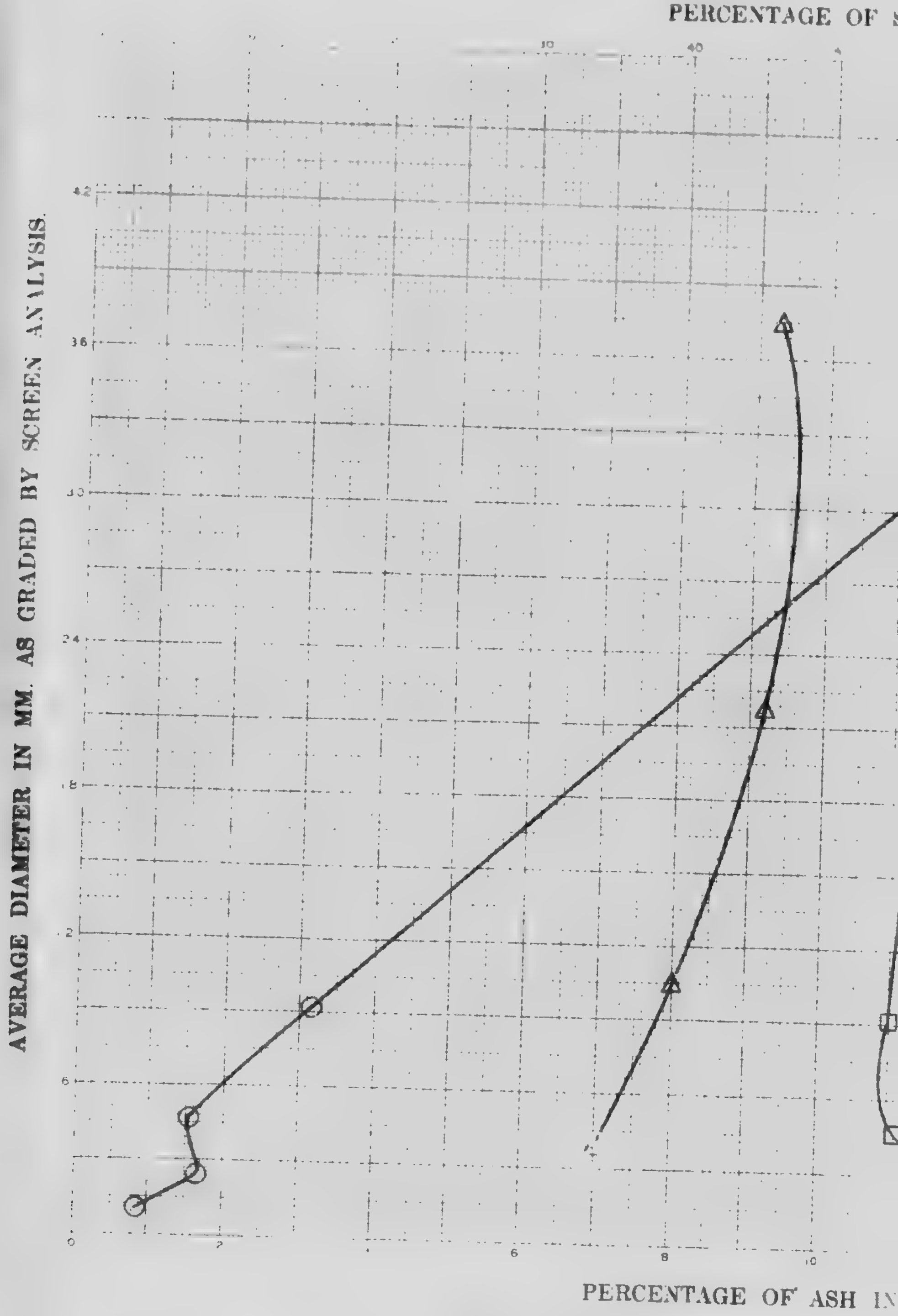
Summary Statement of Effect of Washing on Fuel Values.

31.	Recovery of washed coal, including good bone	%	....	Ratio to standard ....
32.	Reduction in ash	%	....	" " ....
33.	" " sulphur	%	....	" " ....
34.	Increase in calorific value—calorimeter	%	....	
35.	Increase in evaporation under boiler	%	....	
36.	Decrease in clinker under boiler	%	....	
37.	Fuel ratio of original coal		....	
38.	" " washed "		....	
39.	Calorific value of original coal		....	
40.	" " washed "		....	

Remarks on Tables C, D, and E.—The results of preliminary tests were such that it was not considered necessary to wash this coal.


AVERAGE DIAMETER IN MM AS GRADED BY SCREEN ANALYSIS.

GRAPHIC RECORD OF SIZING

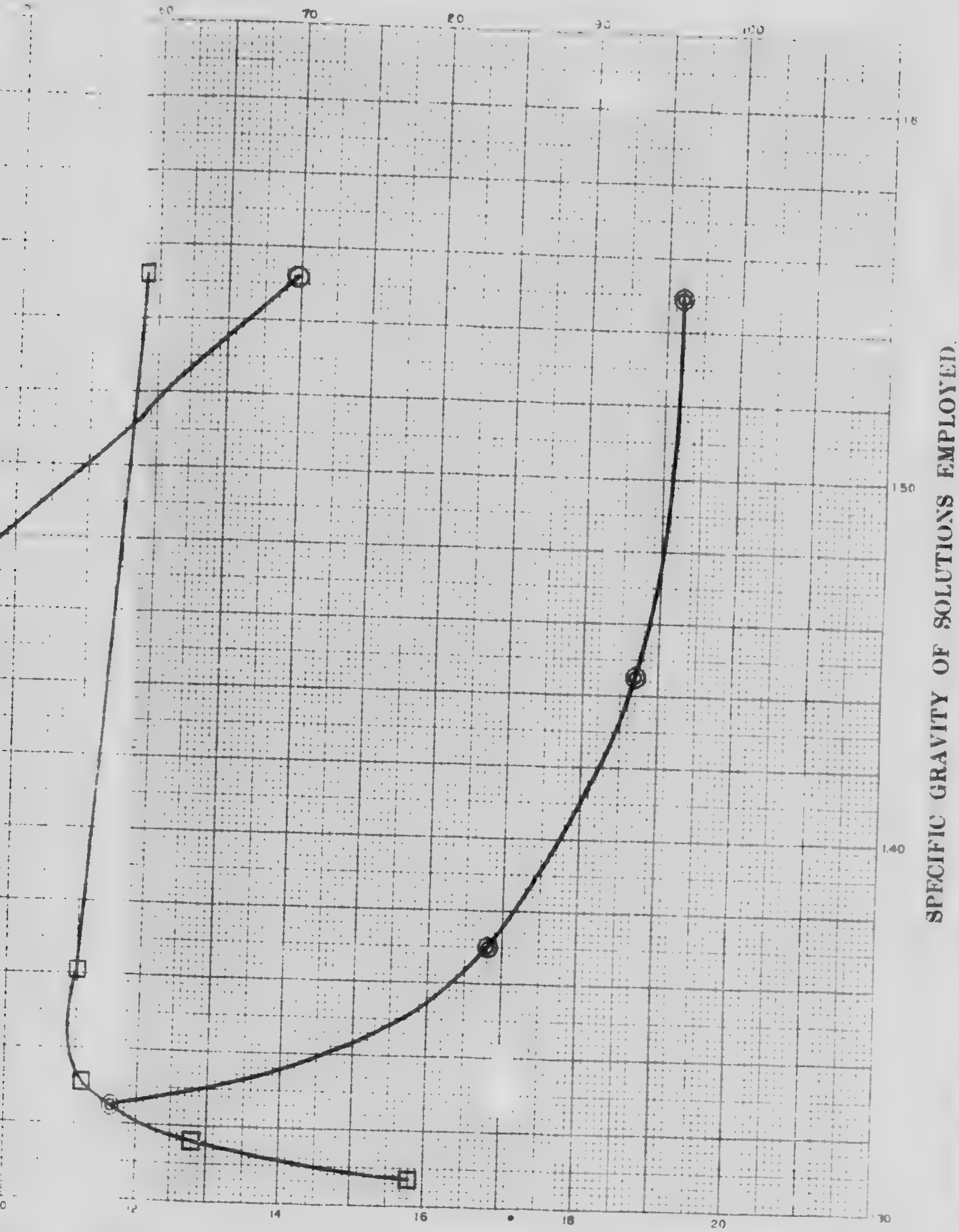


LEGEND: SYMBOLS.

○ Curve showing the relative quantities of the several sizes.
△ " " " " " " " " densities.
□ " " " percentage of ash in each of the several sizes.
⊙ " " " " " " " material floating at the several dens

ZING AND SPECIFIC GRAVITY TESTS.

GE OF SIZE AND OF FLOAT.



ASH IN SIZE AND IN FLOAT.

COAL No. 17
Appendix I, Vol. III

veral densities

COAL.—No. 21 M

Locality. Cumberland, Comox district, Vancouver Island, B.C.

Colliery.—Wellington Colliery Co., Comox lower seam, No. 4 and No. 7 mines mixed in equal parts.

Sample.—A sample was made up of equal quantities of coal taken from two separate mines, both working on the same seam. Seventy-five bags taken from the lower seam of No. 4. This mine is entered [illegible] 1¼ miles long, and the coal was drawn from a number of different points. The coal had been cleaned on a ¾" screen and had then been hand picked. Sampled April 11, 1908.

Seventy-five bags taken from the lower seam of the No. 7 mine. This mine is entered by a slope 2,400 feet long, and the [illegible] from workings on the 1,800 ft. level. The coal was cleaned on a bar screen 16 feet long, with openings from ¾" to 1", and afterwards was hand picked by Chinese labourers. Sampled April 13, 1908.

TABLE A.

Specific Gravity Tests.

	Specific gravity of solution.	Float %	Ash in Float %	Sink %	Ash in Sink
1.	1·510	91·7	7·3	8·3	[illegible]
2.	1·425	85·0	6·0	15·0	46·[illegible]
3.	1·370	79·3	5·2	20·7	38·9
4.	1·325	58·7	4·2	41·3	23·2

The following results are obtained from the above data, and from the chemists results :

5. Good coal, Sp. Gr. under 1·375 .... % yield 80·0 %, ash 5·3
6. Bone coal, Sp. Gr. 1·375 to 1·55 .... " " 13·[illegible] " " 21·7
7. Useful coal—sum of (5) and (6) .... " " 93·0 " " 7·[illegible]
8. Refuse, Sp. Gr. over 1·55 .... " " 7·0 " " 71·5
9. Assay of original sample raw coal as sent to chemist .... " " 12·0
10. " " " " " " .... % sulphur 0·9
11. " " " " " " .... Fuel Ratio 1·91
12. Assay of mixed good and bone coal (5 and 6) .... " " 2·06

Remarks.—The innate ash is fairly high, and the proportion of bone coal moderate, with high ash. The refuse is low in amount and high in ash. The coal, therefore, can be considerably improved by washing, as the proportion of ash in the refuse and bone is comparatively large.

TABLE B

Screen Analysis.

	Maximum Screen MM.	Minimum Screen MM.	Mean MM.	[illegible]	[illegible]
13.	6·34	3·16	4·75	[illegible]	[illegible]
14.	3·16	1·20	2·18	[illegible]	[illegible]
15.	1·20	0·64	0·92	[illegible]	[illegible]
16.	0·64	0·30	0·47	[illegible]	[illegible]
17.	0·30	0·173	0·24	[illegible]	[illegible]
18.	0·173	0·000	0·086	[illegible]	[illegible]

Remarks.—There seemed to be two ash-bearing ma[illegible] coal, one more friable and the other less friable than th[illegible] is comparatively strong and stands shipping and crushing well.

TABLE C.

Results of Washing (Details of Sizes).

	Original coal and its products.	Sizes between 1" and ¼" Total wt. lbs.	Ash. %	Sizes between ¼" and ⅛" Total wt. lbs.	Ash. %	Sizes under ⅛" Total.wt. lbs	Ash. %
19.	Original coal	2885	12·2	1824	11·2	900	15·2
20.	Washed coal	2733	8·7	1591	8·6	590	10·2
21.	Refuse—coarse	140	50·1	116	49·1	71	53·7
22.	Hutch product	109	....	363*	....	.	....
23.	Jig slimes	....	....	45	16·4	....	
24.	Table slimes	....	....	....	....	99	11·1

TABLE D.

Results of Washing (Totals).

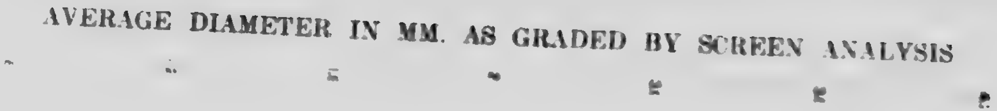
25.	Original coal	wt. in lbs.	5600	%	ash	12·0	%	sulphur	0·9
26.	Washed coal	"	"	4914	"	"	8·9	"	"	0·8
27.	Refuse	"	"	327	"	"	50·6	"	"	
28.	Other products	"	"	341	"	"	....	"	"	....
29.	Loss	"	"	27	"	"	....	"	"	....
30.	Loss in % 0·5.									....

TABLE E.

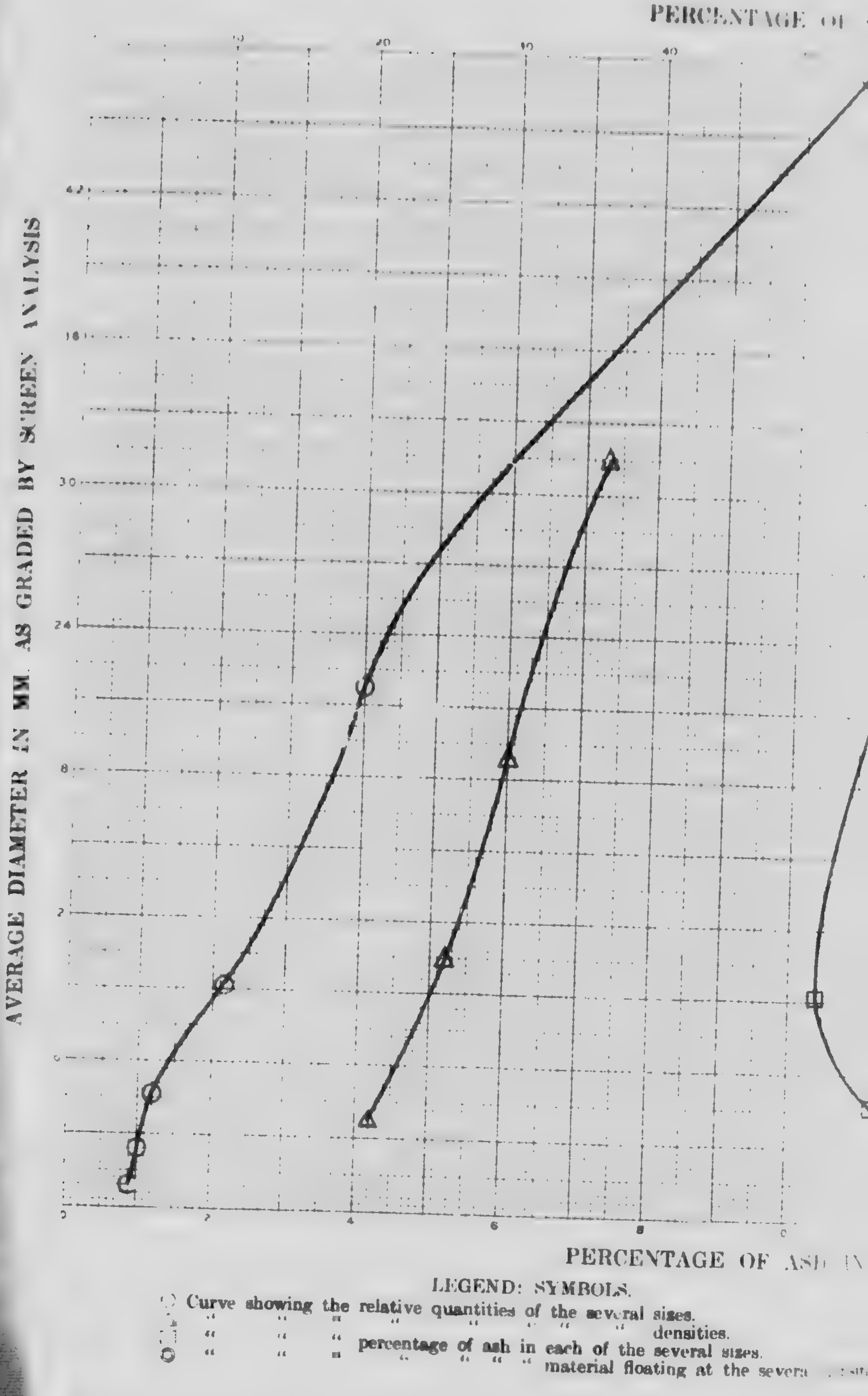
Summary Statement of Effect of Washing on Fuel Values.

31.	Recovery of washed coal, including good bone	%	87·5	Ratio to standard		94·2
32.	Reduction in ash	%	25·8	"	"	85·4
33.	" " sulphur	%	11·1	"	"	....
34.	Increase in calorific value—calorimeter	%	4·4			
35.	Increase in evaporation under boiler	%	5·5			
36.	Decrease in clinker under boiler	%	33·3			
37.	Fuel ratio of original coal		1·91			
38.	" " washed "		1·96			
39.	Calorific value of original coal		7230			
40.	" " washed "		7550			

Remarks on Tables C, D, and E.—The trial, on the whole, was fairly good, but the washed coal of the sizes from 1" to ¼", and under ¼", should have contained less ash. Possibly, also, the ash in the medium sized refuse should have been higher. If it had been possible to repeat the test, better results would have been obtained, and a commercial plant would, undoubtedly, have done better after once r[illegible]g in good working order.

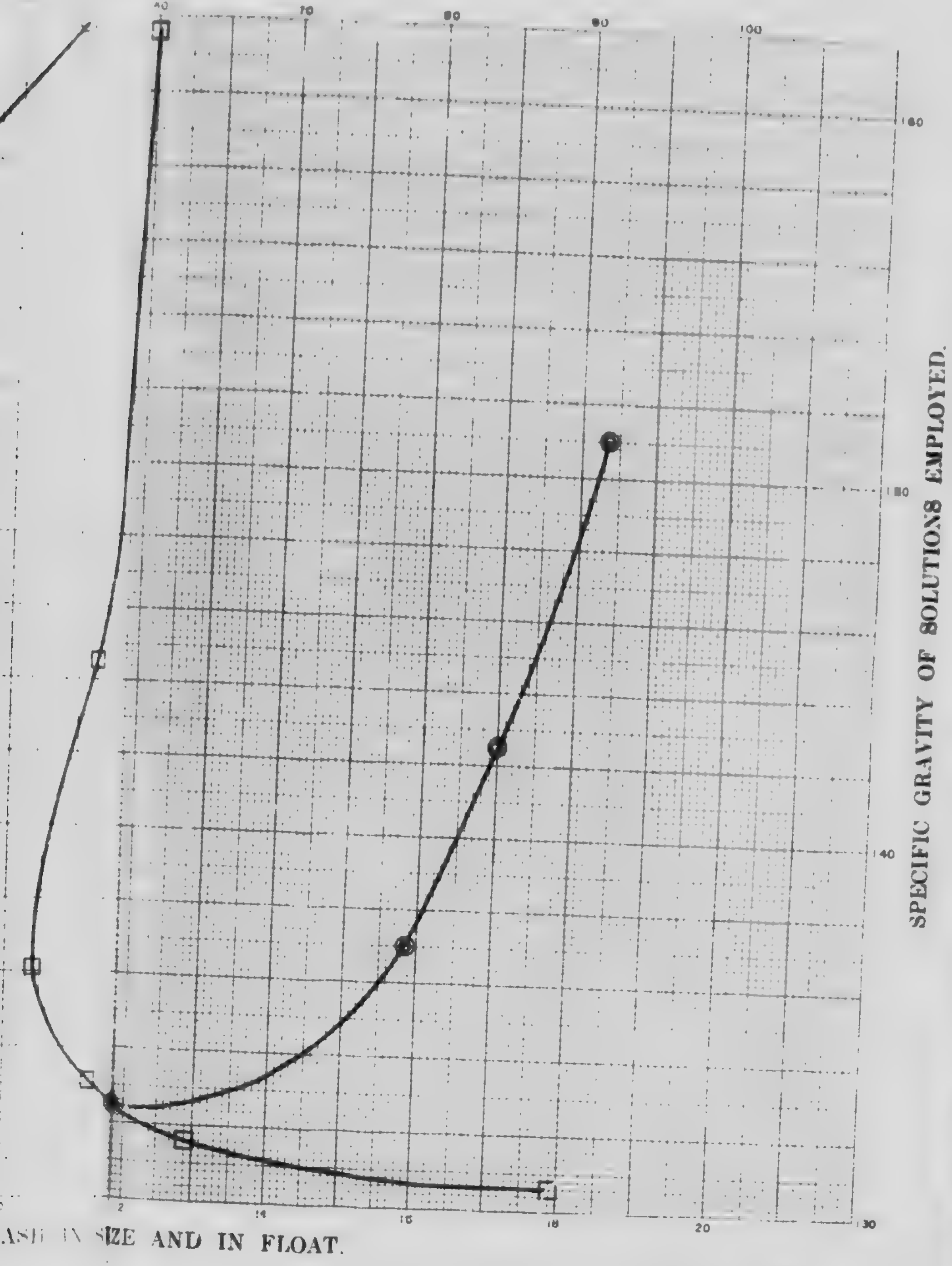

AVERAGE DIAMETER IN MM. AS GRADED BY SCREEN ANALYSIS

GRAPHIC RECORD OF SIZING



ZING AND SPECIFIC GRAVITY TESTS.

GE OF SIZE AND OF FLOAT.



ASE IN SIZE AND IN FLOAT.

COAL No. 21M
Appendix I, Vol. III

VANCOUVER ISLAND.

NORTHERN COAL FIELD.

ERRATUM

On the curve diagrams accompanying the tabulated records of each of th[illegible] is the following legend:—

LEGEND: SYMBOLS

○ Curve showing the relative quantities of the several sizes
[illegible] " " " " [illegible] de[illegible] sizes
[illegible] " " " percentage of ash in each of the several sizes
○ " " " " " [illegible] material floating at the several [illegible]

The above legend is incorrect: in each case it should [illegible]

Curve showing the relative quantities of the several sizes
" " " percentage of ash in each of the several sizes
■ " " " " " material floating at the several [illegible]
△ " " " " " ash in [illegible]

COAL.—No. EX. 31.

Locality.—Alert bay, Vancouver island, B.C.

Colliery.—Pacific Coast Coal Co., Suquash mine.

Sample.—Ninety-one bags supplied by the mine authorities during development of the property. Sampled October, 1909.

TABLE A.

Specific Gravity Tests.

	Specific gravity of solution.	Float %	Ash in Float %	Sink %	Ash in Sink %
1.	1·515.	76·0	7[illegible]	24[illegible]	5[illegible]·4
2.	1·423.	66·9	5·[illegible]	[illegible]	46·7
3.	1·[illegible]3.	62·2	4·5	37·8	4[illegible]
4.	1·318.	28·7	2·7	71·3	24·[illegible]

The following results are obtained from the above data, and from the chemists results :—

5. Good coal, Sp. Gr. under 1·375 ... Yield 62·6 % ash 4·5
6. Bone coal, Sp. Gr. 1·375 to 1·5[illegible] ... " 13·9 " " 2[illegible]·7
7. Useful coal—sum of (5) and (6) ... " 76·5 " " 8·0
8. Refuse, Sp. Gr. over 1·55 ... " [illegible] " " 51·0
9. Assay of original sample raw coal as sent to chemist ... [illegible] 23·0
10. " " " ... [illegible]
11. " " " ... sulphur 1·0
12. Assay of mixed good and bone coal (5) and (6) ... Fuel Ratio 1·24

Remarks.—The [illegible] ash is moderately low. The bone coal is not large in amount but is high in ash. The refuse is large in amount and high in ash. The sample is probably dirtier than the output of the mine will be after the workings have reached a reasonable depth. The coal is eminently suited for washing, but may have to be crushed somewhat too fine.

TABLE B.

Screen Analysis.

	Maximum Screen MM.	Minimum Screen MM.	Mean MM.	% of whole sample	% Ash in size
13.	6·34	3·16	4·75		
14.	3·16	1·20	2·18		
15.	1·20	0·64	0·92		
16.	0·64	0·30	0·47		
17.	0·30	0·173	0·24		
18.	0·173	0·000	0·086		

Remarks.—No screen analyses were made on this coal.

TABLE C.

Results of Washing (Details of Sizes).

	Original coal and its products.	Sizes between 1½″ and ¾″ Total wt. lbs.	Ash. %	Sizes between ¾″ and ¼″ Total wt. lbs.	Ash. %	Sizes under ¼″ Total wt. lbs.	Ash. %
19.	Original coal	5830	25·0	3725	21·3	900	27·9
20.	Washed coal	4989	16·6	2890	14·9	547	10·5
21.	Refuse—coarse	574	48·4	530	49·5	192	53·9
22.	Hutch product	....	....	....	....	....	....
23.	Jig slimes	223	41·3	188	58·3	..49	44.9
24.	Table slimes	....	....	....	....	....	....

TABLE D.

Results of Washing (Totals).

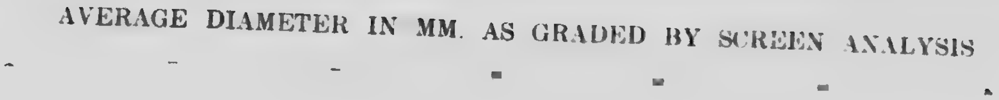
25.	Original coal	wt. in lbs.	10455	% ash	23·0	% sulphur 1·0
26.	Washed coal	" "	8426	" "	15·1	" " 0·9
27.	Refuse	" "	1296	" "	49·4	" " ....
28.	Other products	" "	460	" "	48·7	" " ....
29.	Loss	" "	273	" "	....	" " ....
30.	Loss in % 2·6.					

TABLE E.

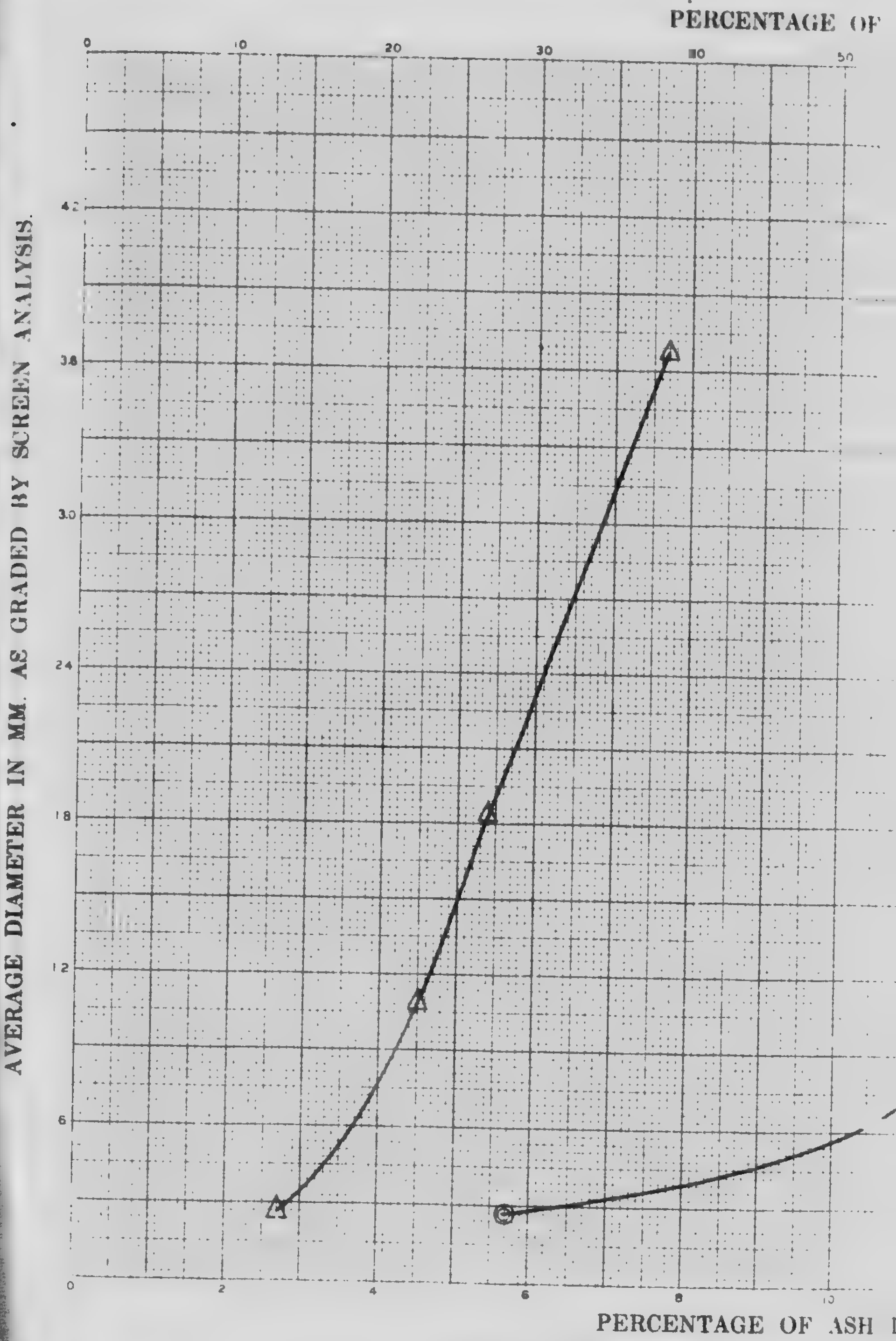
Summary Statement of Effect of Washing on Fuel Values.

31.	Recovery of washed coal, including good bone	%	80·6	Ratio to standard	106·0
32.	Reduction in ash	%	34·3	" "	52·9
33.	" " sulphur	%	10·0	" "	....
34.	Increase in calorific value—calorimeter	%	4·1		
35.	Increase in evaporation under boiler	%	....		
36.	Decrease in clinker under boiler	%	....		
37.	Fuel ratio of original coal		1·24		
38.	" " washed "		1·31		
39.	Calorific value of original coal		6170		
40.	" " washed "		6420		

Remarks on Tables C, D, and E.—This trial was only moderately satisfactory in its results, owing to the fact that an attempt was made to crush the coal as little as possible. The coal is also somewhat unusual in character, and much better results could have been obtained in a second trial, especially with finer crushing.


AVERAGE DIAMETER IN MM. AS GRADED BY SCREEN ANALYSIS

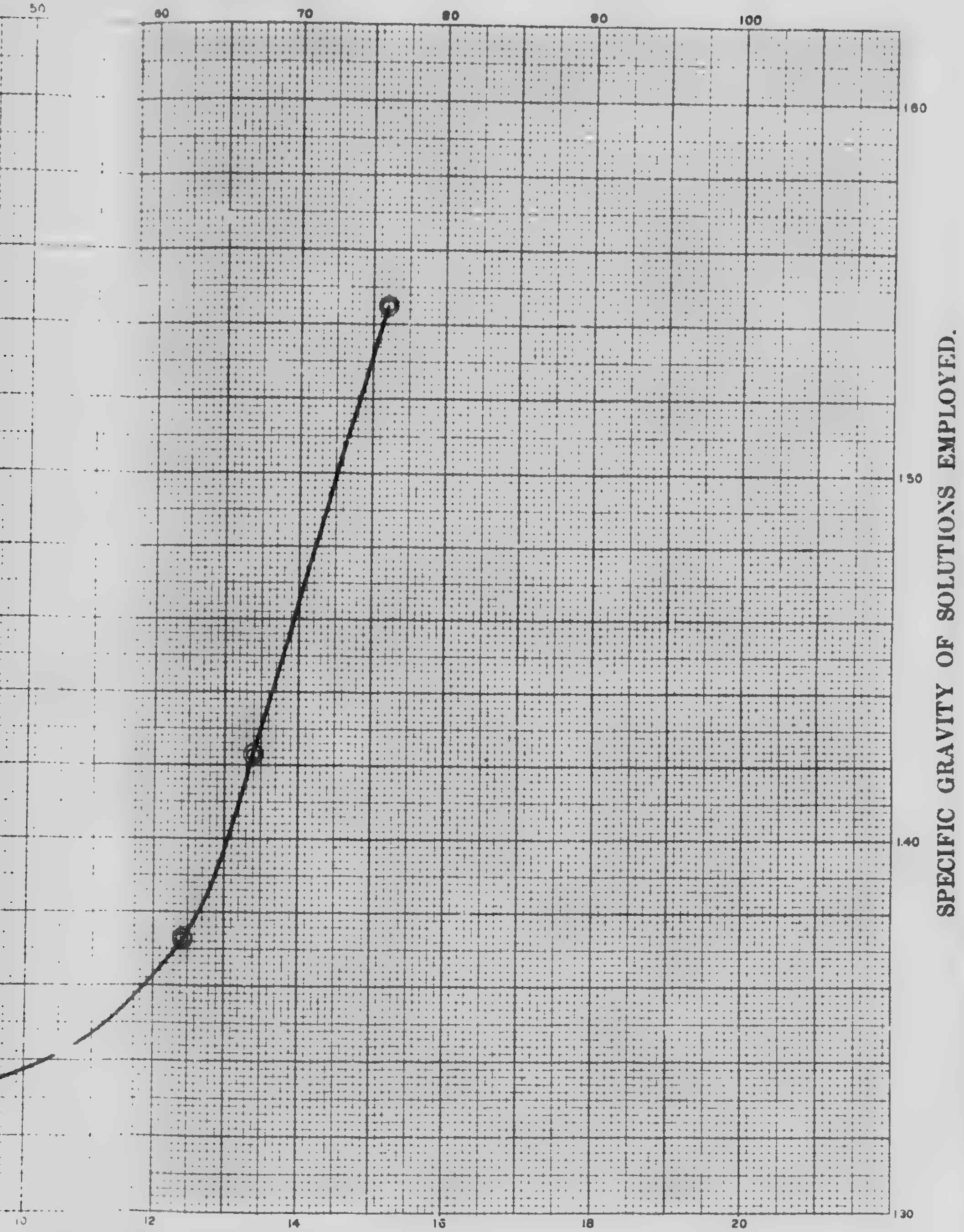
GRAPHIC RECORD OF SIZING



LEGEND: SYMBOLS.
○ Curve showing the relative quantities of the several sizes.
△ " " " " " " " " densities.
□ " " " percentage of ash in each of the several sizes.
◎ " " " " " " " material floating at the several de

IZING AND SPECIFIC GRAVITY TESTS.

GE OF SIZE AND OF FLOAT.



F ASH IN SIZE AND IN FLOAT.

COAL No. Ex. 34
APPENDIX I, VOL. III

several densities

SUMMARY RECORD OF CO

Official number of the colliery as per report

Proximate analysis, etc., of offici
1. Moisture in the check sample s
2. Volatile matter in main sampl
3. Fixed carbon " "
4. Ash " "
5. Sulphur " "
6. Calorific value of " "
7. Calorific value calculated to ash

Proximate analysis, etc., of com scale washing tests
8. Volatile matter in washed coal
9. Fixed carbon " "
10. Ash " "
11. Sulphur " "
12. Calorific value of " "
13. Calorific value calculated to ash f
14. Ash in refuse from coal washing

Experimental washing tests with crushed coal of official samp
15. Clean coal of under 1,375
16. " " " " "
17. Bony " " between 1,375 and
18. " " " " "
19. Refuse of over 1,550. .
20. " " " "
21. Useful coal, being combined cle
22. " " " " "

Summary statement of results of
23. Yield of washed coal—combined
24. Perfection of yield as compare tests. . . . .
25. Reduction in ash due to washin
26. Perfection ash reduction compar tests. . . . .
27. Reduction in sulphur due to wa
28. Increase in calorific value due t
29. " " boiler evaporation d
30. Yield of refuse from washing tes
31. Decrease in clinker in boiler furn

50 = *Gourie Seam, N*. was obtained and tested. in quality than any of the other coals

36 = *Hub Seam, Dom. C. Co. No.* was, however, washed in order to compar coal is an exceptionally high class fue

35 = *Harbour Seam, Dom. C. Co. N* of what ash there is, and the specific gra

35 *SP* = *Phalen Seam, Dom. C. Co. N* improvement.

38 = *Phalen Seam, Dom. C. Co. N*

37 = *Emery Seam, Dom. C. Co. No.* wash well. A trial was, therefore, demands it an excellent washed coal

39 = *Lingan Seam, Dom. C. Co. N* Washing is commercially quite unnecessary,

13 = *Main Seam, N.S.S. & C. Co. No.* ings contain considerable amounts of ash and trial shows satisfactory results which agre

12 = *Main Seam, N.S.S. & C. Co. N* somewhat less improvement. The screen

---

*S = Screened coal. P = Hand pick

TABLE

SUMMARY RECORD OF COAL WASHING TESTS, SYDNEY

Official number of the colliery as per list on page 8, Vol. I, of report		No. 50	No
Proximate analysis, etc., of official samples			
1. Moisture in the check sample sealed at mine	%	......	3
2. Volatile matter in main sample after drying	%	34·7	36
3 Fixed carbon " " " " "	%	53·0	57
4 Ash " " " " "	%	12·3	5
5 Sulphur " " " " "	%	6·4	2
6 Calorific value of " " " "	Cal.	7010	77
7. Calorific value calculated to ash free dry coal	Cal.	7990	81
Proximate analysis, etc., of combined product of large scale washing tests			
8. Volatile matter in washed coal after drying	%	......	38
9. Fixed carbon " " " " "	%	......	59
10 Ash " " " " "	%	......	2
11. Sulphur " " " " "	%		2
12. Calorific value of " " " "	Cal		79
13. Calorific value calculated to ash free dry washed coal	Cal		817
14. Ash in refuse from coal washing—after drying	%	..	54
Experimental washing tests with heavy solutions on fine crushed coal of official samples			
15. Clean coal of under 1,375	yield %	62·8	90
16 " " " " "	ash %	3·4	1
17. Bony " " between 1,375 and 1,550	yield %	20·0	3
18. " " " " " " "	ash %	12·1	13
19. Refuse of over 1,550	yield %	17·2	6
20. " " " "	ash %	48·6	60
21. Useful coal, being combined clean and bony	yield %	82·8	94
22. " " " " " " "	ash %	5·5	2
Summary statement of results of washing			
23. Yield of washed coal—combined product all sizes	%	......	92
24. Perfection of yield as compared with heavy solution tests	%	..	98
25. Reduction in ash due to washing	%	......	54
26. Perfection ash reduction compared with heavy solution tests	%	......	88
27 Reduction in sulphur due to washing	%	......	16
28. Increase in calorific value due to washing	%	......	3
29. " " boiler evaporation due to washing	%	......	5
30. Yield of refuse from washing tests	%	......	6
31. Decrease in clinker in boiler furnace due to washing	%	......	6

Notes and Com

50 = *Gowrie Seam, N. S. Collieries Ltd* (S and P)* This coal was not included in th[illegible] was obtained and tested This sample, which, however, may not have truly represente[illegible] quality than any of the other coals sampled in this field It would, however, apparently wa[illegible]

56 = *Hub Seam, Dom C. Co. No. [illegible] Mine* (S. and P This coal is quite low in ash an[illegible] was, however, washed in order to compare the results of a full scale trial with the specific gr[illegible] coal is an exceptionally high class fuel.

3[illegible] *Harbour Seam, Dom C. Co No. 2.* (S and P) This coal is an excellent fuel [illegible] [illegible] the [illegible], and the specific gravity tests show that they can be materially improv[illegible]

[illegible] *[illegible] Seam, Dom C. Co. No. 5* (S. and P) The remarks on sample 35 ap[illegible] [illegible]

3[illegible] *[illegible] Seam, Dom C. Co No. 1.* (S and P) The remarks on sample 35 app[illegible]

37 = *Emery Seam, Dom C. Co. No. 10* (R M and P) This has the highest ash of an[illegible] washed [illegible] A trial was, therefore, run with satisfactory results. Under present condi[illegible] den[illegible] is it an excellent washed coal can easily be produced

Logan Seam, Dom. C. Co. No. 12 (R M.) Reference to the detailed tests in V[illegible] Washing is commercially quite unnecessary, although the screenings might be washed [illegible]

13 = *Main Seam, N S S & C Co. No. 1.* (S and P.) This coal does not require wash[illegible] ings contain considerable amounts of ash and sulphur and are regularly washed by the Comp[illegible] trial, shows satisfactory results which agree well with the Company's returns

12 = *Main Seam, N.S S & C. Co No. 3.* (S and P.) The remarks on No 13 app[illegible] somewhat less improvement The screenings could be washed with advantage, but th[illegible]

*S = Screened coal. P = Hand picked to remove rubbish R M = Run of mine

TABLE XI.

YDNEY COAL FIELD, CAPE BRETON COUNTY, NOVA SCOTIA.

. 50	No. 36	No	No. 38	No. 37	No. 39	No. 13	No. 12
	3·5	2·1	3·5	4·0	4·9	3·5	5·4
7	36·5	[illegible]	34·3	35·1	37·3	37·4	39·0
3·0	57·6	[illegible]	59·8	53·8	57·9	55·4	54·3
2·3	5·9	[illegible]	5·9	11·1	4·8	7·2	6·7
5·4	2·4	3·7	1·9	2·5	1·8	2·9	2·5
010	7700	7780	7780	7290	7660	7650	7600
990	8180	[illegible]	8270	8200	8050	8250	8150
	38·2			36·9	......	40·2	.
	59·1			57·3	......	56·3	.
	2·7			5·8	...	3·5	
	2·0			2·1	....	1·9	. .
	7950			7710	....	8050	
	8170			8190	....	8340	.
	51·0			47·0	....	43·5	. . .
8	90·5	[illegible]	88·3	77·5	91·0	87·0	88·0
4	1·9	[illegible]	2·6	3·5	2·2	1·9	2·4
·0	3·5	[illegible]	5·2	9·5	3·0	3·5	6·2
1	13·8	[illegible]	18·2	18·1	5·0	12·2	16·1
·2	6·0	[illegible]	6·5	13·0	6·0	9·5	5·8
6	60·9	[illegible]	[illegible]	60·0	50·0	61·6	58·5
8	94·0	[illegible]	[illegible]	87·0	94·0	90·5	94·2
5	2·4	[illegible]	3·5	5·2	2·3	2·3	3·3
	92·5			88·5	....	89·4	
	98·4			101·8	......	98·7	
	54·3			47·8	....	51·4	
	88·9			89·6	....	65·7	
	16·7			16·0	....	34·5	
	3·2			5·7	....	5·2	
	5·6			5·8	......	4·8	
	6·9			11·7	....	8·1	
	[illegible]			52·2	....	66·1	

and Comments.

[illegible] sed, but later a small sample of freshly mined coal
[illegible] roduce under more favourable conditions, is poorer
[illegible] ent of good washed fuel.
[illegible] commercial sense it is in no need of washing. It
[illegible] comparison is quite satisfactory and the washed

[illegible] Its screenings probably carry a considerable part
[illegible]
[illegible] at washing the slack would probably effect less

[illegible]
[illegible] and the specific gravity tests showed that it should
[illegible] necessary except for coking, but when the market

[illegible] ple indicates a seam of exceptionally good quality.
[illegible] desired.
[illegible], but should be washed for coking Its screen-
[illegible] aterial quite suitable for coking The washing

[illegible] s even less necessary and would probably effect
[illegible]

[illegible]

SUMMARY REC

Official number of the colliery [illegible] I

Proximate analysis, etc., of check
1. Moisture in the check sample a
2. Volatile matter in main sampl
3. Fixed carbon
4. Ash
5. Sulphur
6. Calorific value of
7. Calorific value calculated to ash

Proximate analysis, etc., of combin
ing tests
8. Volatile matter in washed coal at
9. Fixed carbon "
10. Ash
11. Sulphur
12. Calorific value of "
13. Calorific value calculated to ash
14. Ash in refuse from coal washing

Experimental washing tests with
coal of official samples
15. Clean coal of under 1.375
16. " "
17. Bony " " between 1.375 and
18. " " "
19. Refuse of over 1.550
20. " "
21. Useful coal, being combined clean
22. " "

Summary statement of results of w
23. Yield of washed coal—combined
24. Perfection of yield as compared w
25. Reduction in ash due to washing
26. Perfection ash reduction compare
27. Reduction in sulphur due to wash
28. Increase in calorific value due to
29. " " boiler evaporation du
30. Yield of refuse from washing
31. Decrease in clinker in boiler tri

14 = *In* [illegible]
impossible to remove. The ash is [illegible]
in view of this it is questionable [illegible]
15 = *Port Hood Coal. R R.* [illegible]
tests indicate greater difficulty in was

4 = *Six Foot Seam, A* [illegible]
[illegible] yield a very high class
13 = *Foord Seam, A*
washing will be only moder
although the data at hand
1 = *Third Seam, A* [illegible]
in the matter of sulphur. It was
2 = *Cage Pit Seam* [illegible]
that it can not be large
8 = *Main Seam, A* [illegible]
screened and hand picked
but the screenings which were not sampl
3 = *Main Seam, I.C. Co., Drummond* Coll
show it to be more suitable for washing than
tests. The screenings were not sampled but th

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*S = Screened coal. P = Hand picked

TABLE X

SUMMARY RECORD OF COAL WASHING T

			In
	Official number of the colliery as per list on page 8, Vol. I, of report		N
	Proximate analysis, etc., of official samples		
1.	Moisture in the check sample sealed at mine	%	
2.	Volatile matter in main sample after drying	%	
3	Fixed carbon " " " " "	%	
4	Ash " " " " "	%	
5.	Sulphur " " " " "	%	1
6.	Calorific value of " " " "	%	
7.	Calorific value calculated to ash free dry coal	Cal.	6
		Cal.	7
	Proximate analysis, etc., of combined product of large scale washing tests		
8.	Volatile matter in washed coal after drying	%	4
9.	Fixed carbon " " " " "	%	5
10.	Ash " " " " "	%	
11.	Sulphur " " " " "	%	
12.	Calorific value of " " " "	Cal.	7
13.	Calorific value calculated to ash free dry washed coal	Cal	7
14.	Ash in refuse from coal washing—after drying	%	3
	Experimental washing tests with heavy solutions on fine crushed coal of official samples		
15.	Clean coal of under 1,375	yield %	6
16.	" " " " "	ash %	
17.	Bony " " between 1,375 and 1,550	yield %	20
18.	" " " " " " "	ash %	11
19.	Refuse of over 1,550	yield %	15
20.	" " " "	ash %	39
21.	Useful coal, being combined clean and bony	yield %	85
22.	" " " " " " "	ash %	5
	Summary statement of results of washing		
23.	Yield of washed coal—combined product all sizes	%	86
24.	Perfection of yield as compared with heavy solution tests	%	102
25.	Reduction in ash due to washing	%	37
26.	Perfection ash reduction compared with heavy solution tests	%	86
27	Reduction in sulphur due to washing	%	16
28.	Increase in calorific value due to washing	%	5
29.	" " boiler evaporation due to washing	%	5
30.	Yield of refuse from washing tests	%	13
31.	Decrease in clinker in boiler furnace due to washing	%	56

Notes and Co

Inverness F

14 = *Inverness Coal, I C. & R. Co.* (S and P)* The coals of the Inverness field carry
or impossible to remove. The ash is also moderately high but can be reduced by washing
in view of this it is questionable whether washing would be commercially profitable, in spa
15 = *Port Hood Coal, R R. & C. Co.* (S. and P.) The remarks on No 14 apply to th
tests indicate greater difficulty in washing. A trial was run and confirmed these anticipat

Pictou Fi

4 = *Six Foot Seam, A. C. Co., Vale Colliery.* (S and P) This sample carried enough
not yield a very high class fuel on account of the high innate ash. The trial confirmed these
16 = *Foord Seam, A. C. Co., Allan Shaft.* (R.M , P) This coal was not washed as the
washing will be only moderately effective. It could, however, be somewhat improved, an
although the data at hand do not suffice to determine the commercial expediency of such
1 = *Third Seam, A.C. Co., Albion Colliery.* (R.M) This coal, although moderately h
in the matter of sulphur. It was, however, washed with fairly satisfactory results. Screen
2 = *Cage Pit Seam, A.C. Co., Albion Colliery.* (R.M.) This coal is comparatively low
that it can not be largely improved by washing. Its screenings could no doubt be washed wi
5 = *Main Seam, A.C. Co., Acadia Colliery.* (S. and P.) This sample shows less ash an
screened and hand picked coal whereas all the others are run of mine. The coal does not re
but the screenings which were not sampled probably carry more impurity and it may be des
3 = *Main Seam, I C Co, Drummond Colliery.* (S and P) This sample is high in ash an
show it to be more suitable for washing than most of the other samples, its sulphur in particu
tests. The screenings were not sampled but they are probably poorer than this sample an

---

*S = Screened coal. P = Hand picked to remove rubbish R M. = Run of mine.

TABLE XII

SHING TESTS, INVERNESS AND PICTOU FIELDS.

	Inverness Co., N.S.			Pictou County, N.S.				
port	No. 14	No. 15	N[illegible]	No. 16	No. 1	No. 2	No. 8	No. 3
%	9·3	4·7	[illegible]	3·6	....	3·6	1·8	1·4
%	40·0	37·1	[illegible]	33·3	29·8	31·4	26·0	24·7
%	49·6	48·3	[illegible]	55·4	55·5	58·1	64·8	60·8
%	10·4	14·6	[illegible]	11·3	14·7	10·5	9·2	14·5
%	6·0	7·9	[illegible]	0·6	1·4	0·9	0·9	2·5
Cal.	6750	6540	[illegible]	7550	[illegible]990	7320	7700	7200
Cal.	7530	7660	[illegible]	8290	8200	8180	8480	8420
wash-								
%	42·5	37·9	33·2	......	30·8	....	....	25·3
%	51·0	51·2	51·2	......	56·9	....	....	63·4
%	6·5	10·9	12·6	......	12·3	....	....	11·3
%	5·0	6·7	1·6	......	1·0	....	....	1·3
Cal.	7110	6970	7000	......	7250	....	....	7530
Cal.	7610	7820	8110	......	8270	....	....	8490
%	34·4	26·8	58·[illegible]	......	33·1	....	....	36·0
ushed								
ld %	65·0	38·0	64·6	83·7	77·5	71·7	79·4	77·0
sh %	3·6	4·9	8·7	7·2	10·0	5·9	4·0	7·3
ld %	20·0	40·0	21·9	11·8	13·5	23·3	14·9	12·0
sh %	11·7	12·0	15·5	16·9	18·9	14·8	21·1	24·6
ld %	15·0	22·0	13·5	4·5	9·0	5·0	5·7	11·0
sh %	39·1	36·5	56·8	57·4	48·0	50·2	45·3	50·8
ld %	85·0	78·0	86·5	95·5	91·0	95·0	94·3	89·0
in %	5·6	8·3	10·5	8·4	11·4	8·1	6·7	9·7
%	[illegible]6·7	75·[illegible]	82·5	......	86·0	....	....	82·0
%	102·0	96·8	95·4	......	94·5	....	....	92·1
%	37·5	25·4	27·2	......	16·3	....	....	22·1
s %	86·1	76	83·3	......	92·7	....	....	85·8
%	16·7	15·[illegible]	0·0	......	28·6	....	....	48·0
%	5·3	6·[illegible]	6·1	......	3·7	....	....	4·3
%	5·0	5·8	4·2	......	7·2	....	....	8·3
%	13·3	22·9	15·[illegible]	...	12·1	....	....	15·0
%	56·7	39·4	33·4	......	9·6	....	....	35·3

and Comments.

Inverness Field

field carry exceptional quantities of sulphur, much of which occurs in a form which is difficult
by washing. A trial was run, but as anticipated it failed to reduce the sulphur materially, and
stable, in spite of the fact that it decidedly improves the coal for use in boilers.
apply to this coal, but this sample shows even more ash and sulphur and the specific gravity
these anticipations.

Pictou Field

ned enough ash to justify washing although the specific gravity tests indicated that it would
firmed these indications, but, nevertheless, produced a good yield of good clean coal.
ashed as the ash is not high for run of mine coal and the specific gravity tests indicate that
improved, and if screened, the fines could almost certainly be decidedly benefited by washing,
of such treatment.
oderately high in ash, is so constituted as to benefit comparatively little by washing, except
ales. Screenings would undoubtedly benefit very much more than run of mine coal.
aratively low in ash for run of mine, and fortunately so, as the specific gravity tests indicate
washed with great advantage.
less ash and higher calorific power than any other in the field, but this may be because it is
does not require washing commercially and would not benefit very largely by it in any case,
may be desirable to wash them.
gh in ash and sulphur for screened coal from this field, but fortunately the specific gravity tests
ur in particular being easily reduced by one half. The washing trial confirmed the preliminary
sample and would benefit considerably more by washing.

ine.

SUMMARY RECORD OF

Official number of the c llery as per

Proximate analysis, etc., of offici
1. Moisture in the check sample s
2. Volatile matter in main sampl
3. Fixed carbon “ “
4. Ash
5. Sulphur “ “ “
6. Calorific value of “ “
7. Calorific value calculated to as
Proximate analysis, etc., of comb
8. Volatile matter in washed coal
9. Fixed carbon “ “ “
10. Ash “ “
11. Sulphur “ “
12. Calorific value of “
13. Calorific value calculated to as
14. Ash in refuse from coal washin
Experimental washing tests with official samples
15. Clean coal of under 1,375
16. “ “ “
17. Bony “ “ between 1,375 a
18. “ “ “
19. Refuse of over 1,550
20. “ “ “ “
21. Useful coal, being combined cle
22. “ “ “ “
Summary statement of results of
23. Yield of washed coal - combine
24. Perfection of yield as compared
25. Reduction in ash due to washi
26. Perfection ash reduction compa
27. Reduction in sulphur due to w
28. Increase in calorific value du
29. “ “ boiler evap
30. Yield of refuse from w
31. Decrease in clinker in b

5 = *Springhill, C. Ry. & C. Co.*, N
coke making, does not wash out to an
still greater improvement

6 = *Springhill, C. Ry. & C. Co.*, N
was washed with good results, partic
by washing.

7 = *Chignecto Coal, M. C. R. &*
the testing staff. It is possible to consid
too high for coke making, and it is unlik
with advantage.

9 = *River Hebert Coal, Minudie C. Co.*
other coals from this field could be washed
considerable demand for fine washed coal

10 = *Joggins Coal, C. C. & Ry. Co.*
to wash than either of the others the

11 = *King's Mine, Minto* (S and P
much cleaner than the trial indicates, but
commercially justifiable, but possibly th

---

*S = Screened coal. P = Hand picked

TABLE X

SUMMARY RECORD OF COAL WASHING TESTS, SPRI

Official number of the colliery as per list on page 9, Vol. I, of report

Proximate analysis, etc., of official samples
1. Moisture in the check sample se[illegible] at mine
2. Volatile matter in main sample [illegible] drying
3. Fixed carbon " " " " "
4. Ash " " " " "
5. Sulphur " " " " "
6. Calorific value of " " " "
7. Calorific value calculated to ash free dry coal

Proximate analysis, etc., of combined product of large scale washing tests
8. Volatile matter in washed coal after drying
9. Fixed carbon " " " " "
10. Ash " " " " "
11. Sulphur " " " " "
12. Calorific value of " " " "
13. Calorific value calculated to ash free dry washed coal
14. Ash in refuse from coal washing—after drying

Experimental washing tests with heavy solutions on fine crushed coal of official samples
15. Clean coal of under 1,375 . . . yield
16. " " " " . . . ash
17. Bony " " between 1,375 and 1,550 . . . yield
18. " " " " " " " . . . ash
19. Refuse of over 1,550 . . . yield
20. " " " " . . . ash
21. Useful coal, being combined clean and bony . . . yield
22. " " " " " " " . . . ash

Summary statement of results of washing
23. Yield of washed coal—combined product all sizes
24. Perfection of yield as compared with heavy solution tests
25. Reduction in ash due to washing
26. Perfection ash reduction compared with heavy solution tests
27. Reduction in sulphur due to washing
28. Increase in calorific value due to washing
29. " " boiler evaporation due to washing
30. Yield of refuse from washing tests
31. Decrease in clinker in boiler furnace due to washing

Notes and Comm

5 = *Springhill, C. Ry. & C. Co., No. 2.* (S. and P.)* This coal does not require washing coke making, does not wash out to any considerable extent. It was, however, washed with mod still greater improvement.

6 = *Springhill, C. Ry. & C. Co., No. 3.* (S. and P.) This coal is similar to No. [illegible] but [illegible] was washed with good results, particularly as regards steaming qualities. The screenings by washing.

7 = *Chignecto Coal, M. C. R. & P. Co.* Special. This sample differed from all other the testing staff. It is possible to considerably reduce [illegible] and thus to improve the too high for coke making, and it is unlikely that washing would prove commercially profit with advantage.

9 = *River Hebert Coal, Minudie C. Co.* (S. and P.) This coal is similar in character to No. other coals from this field could be washed much cleaner; but this is commercially out of the considerable demand for fine washed coal.

10 = *Joggins Coal, C. C. & Ry. Co.* (S. and P.) This sample is similar to the two others to wash than either of the others, the improvement in steaming qualities being particularly

11 = *King's Mine, Minto.* (S. and P.) This coal is different in character from the much cleaner than the [illegible] commercially justifiable, but possibly the screenings could be treated with advantage.

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*S = Screened coal. P = Hand picked to remove rubbish. R. M. = Run of mine

TABLE XIII

TS, SPRINGHILL, JOGGINS, AND GRAND LAKE FIELDS.

	[illegible] N.S.		Joggins-Chignecto Field, N.S.			Grand Lake Field N.B.
	No. 5	[illegible]	No. 7	No. 9	No. 10	No. 11
%	2·8	[illegible]	3 6	3·8	1·3	1·3
%	32 3	[illegible]	41 0	35·7	36·6	32·2
%	58 5	[illegible]	45·7	48·8	44·8	53·4
%	9·2	[illegible]	13·3	15 5	18·6	14·4
%	1·6	[illegible]	6·4	6·7	5·4	5·8
Cal.	7430	[illegible]	6750	6570	6440	7160
Cal	8180	[illegible]	7790	7780	7910	8360
hi g tests						
%	33 1	34·7	41·3	37·3	38·1	34·0
%	59·8	57·0	49·6	51·7	5!·6	56·6
%	7 1	8·3	9·1	11·0	10·3	9·4
%	1·4	1·5	6·2	6·3	4·8	4·9
Cal	7700	7540	7160	7000	7080	7680
Cal.	8290	8220	7880	7870	7890	8480
%	31·5	45·0	31·0	49·5	46·0	38·8
coal						
yield %	84·0	80·0	61·5	57·2	61·5	56·8
ash %	5 1	5 4	5·4	4·6	6·0	4·4
yield %	10·5	10·0	27·5	19·1	17·0	19·2
ash %	14·7	19·0	12·9	9·7	13·0	15·1
yield %	8 5	10 0	11·0	23·7	21·5	24·0
ash %	47·3	48·5	40·0	45·0	53·0	38·6
yield %	91·5	90 9	89·0	76·3	78·5	76·0
ash %	6·1	7 1	7·5	5·9	7·8	6·9
%	84·6	87 9	87·0	79·4	78·7	82·4
%	89·2	96 7	97·8	104·1	100·2	108·3
%	22 8	[illegible]	31·6	29·0	44·6	34·7
%	85 6	85·5	82·5	53·7	75·7	73·4
%	12 5	[illegible]	3·1	6·0	11·2	15·5
%	[illegible]	[illegible]	6 1	6·5	9·9	7·3
%	12·7	22 4	11·2	9·3	10·8	13·7
%	16·6	11·4	10·5	17·8	20·1	16·0
%	37·8	36·4	34·3	3·6	53·6	18·3

nd Comments.

[illegible] Field

e washing under present commercial conditions, and its sulphur, which is rather high for
d with moderately good results, and if slack had been tested it would, no doubt, have shown

, but in somewhat greater need of washing and is better adapted to such treatment. [illegible]
screenings were not sampled but unquestionably would have been even more improved

[illegible]

[illegible] having been taken by the Company rather than by a member of
prove the quality of the coal by washing, but the sulphur even in the washed coal is far
ably profitable under present conditions, although the screenings can probably be treated

ter to No. 7, but is more difficult to wash satisfactorily. If crushed very small it and the
out of the question at present as they are not suitable for coking and there is no other

wo others from the same field but carries more ash and less sulphur. It is a better coal
rticularly marked. In general the remarks on 7 and 9 apply to this coal also

N.B. Field

the [illegible] eastern coals and cannot be very easily compared with them. It can be washed
[illegible] conditions washing the run of the mine would not be

SUMMARY RECORD OF

Official number of the colliery as per l

Proximate analysis, etc., of official
1. Moisture in the check sampl
2. Volatile matter in main sampl
3. Fixed carbon " "
4. Ash " "
5. Sulphur " "
6. Calorific value of
7. Calorific value calculated to ash f

Proximate analysis, etc., of combin
8. Volatile matter in washed coal af
9. Fixed carbon " " "
10. Ash " " "
11. Sulphur " " "
12. Calorific value of " "
13. Calorific value calculated to ash f
14. Ash in refuse from coal washing

Experimental washing tests with he
official samples
15. Clean coal of under 1,375
16. " " " "
17. Bony " " between 1,375 and
18. " " " " " "
19. Refuse of over 1,550
20. " " " "
21. Useful coal being combined clean
22. " " " " "

Summary statement of results of w
23. Yield of washed coal—combined
24. Perfection of yield as compared w
25. Reduction in ash due to washing.
26. Perfection ash reduction compar
27. Reduction in sulphur due to wasl
28. Increase in calorific value due to
29. " " boiler evaporation du
30. Yield of refuse from washing test
31. Decrease in clinker in boiler furn

40 = *Western Dom. Collieries, Taylorton, S*
41 = *Eureka Coal & B. Co., Estevan, Sas*

46 = *Strathcona Coal Co., Strathcona, Al*
42 = *Parkdale Coal Co., Edmonton, Alta*
45 = *Standard Coal Co., Edmonton, Alta*
These coals are all true lignites and all a

43 = *Canada West Coal Co., Taber, Alta*
44 = *Galt Coal, A. R. & I. Co., Lethbridge,*
These coals are lignitic in character, being
enough to justify washing. They are very sa

---

* = Screened coal. P = Hand picked to ren

TA

SUMMARY RECORD OF COAL WASHING TESTS,

Official number of the colliery as per list on page 9, Vol. I, of report

Proximate analysis, etc., of official samples
1. Moisture in the check sample sealed at mine
2. Volatile matter in main sample after drying
3. Fixed carbon “ “ “ “ “
4. Ash “ “ “ “ “
5. Sulphur “ “ “ “ “
6. Calorific value of “ “ “ “
7. Calorific value calculated to ash free dry coal

Proximate analysis, etc., of combined product of large scale washing
8. Volatile matter in washed coal after drying
9. Fixed carbon “ “ “ “ “
10. Ash “ “ “ “ “
11. Sulphur “ “ “ “ “
12. Calorific value of “ “ “ “
13. Calorific value calculated to ash free dry washed coal
14. Ash in refuse from coal washing - after drying

Experimental washing tests with heavy solutions on fine crushed coa
official samples
15. Clean coal of under 1,375 .... yi
16. “ “ “ “ .... a
17. Bony “ “ between 1,375 and 1,550 .... yi
18. “ “ “ “ “ “ “ .... a
19. Refuse of over 1,550. .... yi
20. “ “ “ “ .... a
21. Useful coal being combined clean and bony .... yi
22. “ “ “ “ “ “ “ .... a

Summary statement of results of washing
23. Yield of washed coal - combined product all sizes
24. Perfection of yield as compared with heavy solution tests
25. Reduction in ash due to washing
26. Perfection ash reduction compared with heavy solution tests
27. Reduction in sulphur due to washing
28. Increase in calorific value due to washing
29. “ “ boiler evaporation due to washing
30. Yield of refuse from washing tests
31. Decrease in clinker in boiler furnace due to washing

Notes and Co

40 = *Western Dom. Collieries, Taylorton, Sask.* (S. and P.)* *Souris Field –*
41 = *Eureka Coal & B. Co., Estevan, Sask.* (R.M.)

46 = *Strathcona Coal Co., Strathcona, Alta.* (S.) *Edmonton Field*
42 = *Parkdale Coal Co., Edmonton, Alta.* (S.)
45 = *Standard Coal Co., Edmonton, Alta.* (S.)
These coals are all true lignites and all are reasonably clean as regards impurities whi

43 = *Canada West Coal Co., Taber, Alta.* (S.) *Belly River Field*
44 = *Galt Coal, A. R. & I. Co., Lethbridge, Alta.* (S. and P.)
These coals are lignitic in character, being intermediate between true lignites and b
enough to justify washing. They are very satisfactory coals for domestic purposes

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* = Screened coal. P = Hand picked to remove rubbish.

TABLE XIV

TESTS, ALBERTA AN[illegible]KATCHEWAN LIGNITE FIELDS.

report		No.		Edmonton Field, Alta.		Belly River Field, Alta.	
			46	No. 42	No. 45	No 43	No. 44
	%	[illegible]	22·7	22·5	23·5	13·0	8·4
	%	19	41·0	27·8	42·0	36·0	37·5
	%	42·[illegible]	47·6	51·3	49·9	49·9	51·5
.	%	8·1	1·4	10·9	8·1	14·1	11·0
. .	%	0·[illegible]	0·4	0·4	0·4	1·4	0·8
. . . .	Cal.	59[illegible]	5960	6060	6310	6130	6510
. . . .	Cal.	617[illegible]	5730	6800	6870	7140	7310
le washing tests							
. . .	%						
. . . . .	%						
. . . . .	%						
. . . . .	%						
	Cal						
. . .	Cal						
. . . .	%						
ushed coal of							
. . yield	%		0·0	0·0	0·0	34·0	83·5
. . ash	%		0·0	0·0	0·0	5·4	6·8
. . . yield	%		7·0	96·0	97·0	60·0	12·0
. . . . ash	%		7·8	10·2	8·0	15·4	20·0
. . . yield	%	5·0	3·0	4·0	3·0	6·0	4·5
. . . . ash	%	25·0	7·8	55·0	41·3	45·0	52·0
. . . . yield	%	95·0	7·0	96·0	97·0	94·0	95·5
ash	%	7·[illegible]	7·8	10·2	8·0	11·8	8·4
. .	%						
. . .	%						
ts .	%						
. . . .	%						
. . .	%						
. . .	%						

s and Comments.

aris F[illegible]

onton F[illegible]

urities which [illegible] Non[illegible] were washed

ater Field [illegible]

es and bitum[illegible] [illegible] removable ash than the lignites proper, but not
poses

SUMMARY RECORI

Official number of the collier

Proximate analysis, etc , of offi
1. Moisture in the check sampl
2. Volatile matter in main sa
3. Fixed carbon
4. Ash
5. Sulphur
6. Calorific value of
7. Calorific value calculated to a
Proximate analysis, etc , of comb
8. Volatile matter in washed coal
9 Fixed carbon "
10. Ash "
11. Sulphur " "
12. Calorific value of "
13. Calorific value calculated to a
14 Ash in refuse from coal washin
Experimental washing tests with official samples
15. Clean coal of under 1 375
16 "
17. Bony " " between 1 375 a
18 " "
19 Refuse of over 1.55
20 " " " "
21. Useful coal, being combined, cl
22 " " " " "
Summary statement of results o
23. Yield of washed coal—combine
24. Perfection of yield as compare
25. Reduction in ash due to washi
26. Perfection ash reduction comp
27. Reduction in sulphur due to w
28. Increase in calorific value due
29. " " boiler evaporation
30. Yield of refuse from washing t
31. Decrease in clinker in boiler te

47 = *Lun-Breckenridge Collrry* (R
and contains an exceptionally large amou
It was not washe

48 = *Leitch Colliery, L C Ltd* (R M
32 = *Hillcrest, C. & C Co* (R M
33 = *No. 1 Seam, Bellevue, W C Collier*
28 = *No. 1 Seam, Lille, W. C. Collier*
34 = *No 2 Seam, Denison, I C. & C*
34 SP = *No. 4 Seam, Denison, I. C. &*

The above coals are very much alike
called "high grade coals," but all are low
or dry cleaning plants for this purpose, and
in so far as a market could be found for the

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*P = Hand picked to remo

TA

SUMMARY RECORD OF COAL WASHING TES

Official number of the colliery as per list on page 10, Vol. I, of report

Proximate analysis, etc., of official samples
1. Moisture in the check sample sealed at mine
2. Volatile matter in main sample after drying
3. Fixed carbon " " " " "
4. Ash " " " " "
5. Sulphur " " " " "
6. Calorific value of " " " "
7. Calorific value calculated to ash free dry coal

Proximate analysis, etc., of combined product of large scale washing

8. Volatile matter in washed coal after drying
9. Fixed carbon " " " " "
10. Ash " " " " "
11. Sulphur " " " " "
12. Calorific value of " " " "
13. Calorific value calculated to ash free dry washed coal
14. Ash in refuse from coal washing after drying

Experimental washing tests with heavy solutions on fine crushed coal

official samples

15. Clean coal of under 1,375 . . .
16. " " " " " . . . .
17. Bony " " between 1,375 and 1,550
18. " " " " " " "
19. Refuse of over 1,550. . . .
20. " " " " . .
21. Useful coal, being combined, clean and bony
22. " " " " " " "

Summary statement of results of washing

23. Yield of washed coal combined product all sizes
24. Perfection of yield as compared with heavy solution tests
25. Reduction in ash due to washing . .
26. Perfection ash reduction compared with heavy solution tests
27. Reduction in sulphur due to washing.
28. Increase in calorific value due to washing
29. " " boiler evaporation due to washing
30. Yield of refuse from washing tests. .
31. Decrease in clinker in boiler furnace due to washing

Notes and Con

47 - *Lun-Breckenridge Colliery* (R M * This sample was taken when the mine was
and contains an exceptionally large amount of ash and also a good deal of slaty matter,
It was not washed.

48 = *Leitch Colliery, L C. Ltd* (R M
32 = *Hillcrest, C. & C. Co.* (R M.)
33 = *No 1 Seam, Bellevue, W. C. Collieries.* (R M
28 = *No. 1 Seam, Lille, W. C. Collieries* (R M
34 = *No. 2 Seam, Denison, I. C. & C. Co* (R M.)
34 *SP.* = *No. 4 Seam, Denison, I. C. & C. Co* (R M and P.)

The above coals are very much alike and can scarcely be intelligibly compared with
called "high grade coals," but all are low in sulphur and are suitable for coke making
try cleaning plants for this purpose, and it is probable that it would be
so far as a market could be found for the lump. The time is not yet ripe for washeries

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*P = Hand picked to remove rubbish. R M. = Run of mine.

TABLE XV

[illegible]NG TESTS, EASTERN [illegible] OWSNEST PASS COAL FIELDS.

	[illegible] brook Alta		Frank, Alta.			Coleman, Alta.	
report	No. 17	18	No. 32	No. 33	No. 28	No. 34	No. 34 SP
			[illegible]·0	0·9	1·7	2·0	2·0
	30·1	[illegible]	29·3	27·6	25·0	25·1	23·9
	40·2	[illegible]	55·4	56·9	58·6	55·1	59·9
	29·7	[illegible]	15·3	15·5	16·4	19·8	16·2
	1·2	[illegible]	0·6	0·8	0·5	0·4	0·6
Cal	5450	[illegible]	6920	6880	6930	6510	6960
Cal	775[illegible]	[illegible]	8170	8140	8290	8120	8310
washing tests							
%			29·8	28·4	......	26·4	.
%			60·4	58·9	......	62·0	. . .
%			9·8	12·7	......	11·6	. . .
Cal			0·5	0·5	......	0·4	.
Cal			7450	7210	......	7320	.
%			8260	8260	......	8280	.
shed coal of			55·2	42·0	......	47·6	.
yield %	45·5	[illegible]	60·5	51·7	62·5	48·5	48·0
ash %	7·8	[illegible]	4·1	5·4	4·4	4·4	5·3
yield %	31·0	[illegible]	24·0	35·8	23·0	27·5	41·5
ash %	20·5	[illegible]	15·6	15·0	15·1	7·7	16·3
yield %	23·5	[illegible]	15·5	12·5	14·5	24·0	10·5
ash %	71·0	[illegible]	56·3	45·6	66·0	55·5	51·9
yield %	76·5	[illegible]	84·5	87·5	85·5	76·0	[illegible]·5
ash %	13·0	[illegible]	7·3	9·5	7·3	8·5	10·4
			[illegible]·7	85·5	......	73·2	
			[illegible]6·7	97·7	......	96·3	
			[illegible]·9	18·1	......	41·4	
			[illegible]·5	74·7	......	73·3	
			[illegible]6·7	37·5	......	0·0	
			7·7	4·8	......	12·4	
			4·8	2·4	......	9·3	
			[illegible]·8	12·8	......	25·7	
			[illegible]4·2	33·4	......	57·4	. .

[illegible]and Comments.

[illegible] was [illegible] and may not represent its normal output. It is a lignitic bituminous coal [illegible] be very greatly improved by washing but would still run very high in ash.

[illegible] Volume III. A[illegible] are high in ash if compared with so [illegible] ash. Some of the collieries already operate washers [illegible] used for coke making in this field, using screenings

SUMMARY RECORD

Official number of the colliery as per li

Proximate analysis, etc., of official
1. Moisture in the check sample se
2. Volatile matter in main sample a
3. Fixed carbon " " ..
4. Ash " " ..
5. Sulphur " .. ..
6. Calorific value of " "
7. Calorific value calculated to ash
Proximate analysis, etc., of combin
ing tests
8. Volatile matter in washed coal af
9. Fixed carbon " " "
10. Ash " " "
11. Sulphur " " "
12. Calorific value of " "
13. Calorific value calculated to ash
14. Ash in refuse from coal washing-
Experimental washing tests with b
coal of official samples
15. Clean coal of under 1,375.....
16. " " " " "
17. Bony " " between 1,375 and
18. " " " " " "
19. Refuse of over 1,550.......
20. " " " "
21. Useful coal, being combined clea
22. " " " " "
Summary statement of results of w
23. Yield of washed coal—combined
24. Perfection of yield as compared w
25. Reduction in ash due to washing
26. Perfection ash reduction compare
27. Reduction in sulphur due to wasl
28. Increase in calorific value due to
29. " " boiler evaporation du
30. Yield of refuse from washing test
31. Decrease in clinker in boiler furn

31 = *Michel No. 3, C.N.P.C. Co.* (S.)*
30 = *Michel No. 7, C.N.P.C. Co.* (S. and
29 = *Michel No. 8, C.N.P.C. Co.* (S. and
51 = *Hosmer No. 1, H.M.Ltd.* (R.M. from
52 = *Hosmer No. 6, H.M.Ltd.* (R.M. from
53 = *Hosmer No. 8, H.M.Ltd.* (R.M. from
27 = *Coal Creek No. 1, C.N.P.C. Co.* (R.M
26 = *Coal Creek No. 5, C.N.P.C. Co.* (R.M

The above 8 coals, although differing some
samples represent only about one-third of the
is more friable than the bone and slate, and, th
All of the coals coke well and the screenings be
With the exception of No. 51, which is a d
to wash readily with considerable improvement
duct before sending it to the ovens. It was o
mine. The results of this test were quite sat

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*S = Screened coal. P = Hand picked to

SUMMARY RECORD OF COAL WASHING TESTS,

Official number of the colliery as per list on page 10, Vol. I, of report.		No
Proximate analysis, etc., of official samples		
1. Moisture in the check sample sealed at mine	%	1
2. Volatile matter in main sample after drying	%	24·
3. Fixed carbon " " " " "	%	62·
4. Ash " " " " "	%	12·
5. Sulphur " " " " "	%	0·
6. Calorific value of " " " "	Cal.	737
7. Calorific value calculated to ash free dry coal	Cal	842
Proximate analysis, etc., of combined product of large scale washing tests		
8. Volatile matter in washed coal after drying	%	25·
9. Fixed carbon " " " " "	%	68·
10. Ash " " " " "	%	6·
11. Sulphur " " " " "	%	0·
12. Calorific value of " " " "	Cal	795
13. Calorific value calculated to ash free dry washed coal	Cal	848
14. Ash in refuse from coal washing—after drying	%	50·
Experimental washing tests with heavy solutions on fine crushed coal of official samples		
15. Clean coal of under 1,375	yield %	77·
16. " " " " "	ash %	3·
17. Bony " " between 1,375 and 1,550	yield %	10·
18. " " " " " " "	ash %	32·
19. Refuse of over 1,550	yield %	12·
20. " " " "	ash %	57·
21. Useful coal, being combined clean and bony	yield %	88
22. " " " " " " "	ash %	6·
Summary statement of results of washing		
23. Yield of washed coal—combined product all sizes	%	82
24. Perfection of yield as compared with heavy solution tests	%	93·
25. Reduction in ash due to washing	%	50·
26. Perfection ash reduction compared with heavy solution tests	%	109·
27. Reduction in sulphur due to washing	%	0·
28. Increase in calorific value due to washing	%	7·
29. " " boiler evaporation due to washing	%	5·
30. Yield of refuse from washing tests	%	16
31. Decrease in clinker in boiler furnace due to washing	%	59·

Notes and Com

31 = *Michel No. 3, C.N.P.C. Co.* (S.)*
30 = *Michel No. 7, C.N.P.C. Co.* (S. and P
29 = *Michel No 8, C.N.P.C. Co.* (S. and P.)
51 = *Hosmer No. 2, H.M Ltd.* (R.M. from development work).
52 = *Hosmer No. 6, H.M. Ltd.* (R.M. from development work
53 = *Hosmer No. 8, H.M Ltd.* (R.M. from development work.
27 = *Coal Creek No 2, C.N.P.C. Co.* (R.M
26 = *Coal Creek No 5, C.N.P.C. Co.* (R.M.)

The above 8 coals, although differing somewhat in ash and other constituents, are all subs
samples represent only about one-third of the total output of the mines as two-thirds in the av
is more friable than the bone and slate, and, therefore, these lump samples have the somewhat
All of the coals coke well and the screenings being the purer part are the more suitable as well a

With the exception of No. 51 which is a development sample, none of the coals require w
to wash readily with considerable improvement, and as the purchasers of coke become more dis
duct before sending it to the ovens It was only considered necessary to run a washing test
tiene The results of this test were quite satisfactory and confirmed expectations based on t

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*S = Screened coal P = Hand picked to remove rubbish R M = Run of mine

TABLE XVI.

TESTS, WESTERN CROWSNEST PASS COAL FIELD.

	Michel, B.C.			Hosmer, B.C.			Fernie, B.C.	
ort.	No. 31	No. 30	No. 29	No. 51	No. 52	No. 53	No. 27	No. 26
. %	1·4	1·9	3·0	1·7	2·6	4·0	2·2	1·6
%	24·8	22·6	24·1	21·3	25·6	28·0	26·3	24·0
%	62·7	65·5	65·7	63·4	62·0	64·5	64·7	65·2
%	12·5	11·9	10·2	15·3	12·4	7·5	9·0	10·8
%	0·5	0·4	0·6	0·3	0·6	0·6	0·5	0·5
Cal.	7370	7420	7490	7060	7270	7770	7680	7490
Cal	8420	8420	[illegible]	8340	8300	8400	8440	8400
ash-								
%	25·2							
%	68·6			.....	.....	.....	.....	.....
%	6·2			.....	.....	.....	.....	.....
%	0·5	. .		.....	.....	.....	.....	.....
Cal	7950			.....	.....	.....	.....	.....
Cal	8480	....		.....	.....	.....	.....	.....
%	50·7	.....		.....	.....	.....	.....	.....
hed				.....	.....	.....	.....	.....
l %	77·4	80·8	80·0	55·0	69·0	87·9	83·5	84·7
a %	3·3	4·3	[illegible]	4·5	4·2	2·9	2·4	4·6
l %	10·6	9·2	10·0	30·3	17·2	5·7	5·5	8·3
e %	32·9	23·2	17·[illegible]	15·1	18·2	19·3	21·4	23·2
l %	12·0	10·0	10·0	14·7	13·8	6·4	11·0	7·0
a %	57·3	60·0	60·0	58·6	52·6	55·5	56·0	69·0
l %	88·0	90·0	90·0	85·3	86·2	93·6	89·0	93·0
a %	6·8	6·2	4·6	8·3	7·0	3·9	3·6	6·2
%	82·0			.....	.....	.....	.....	.....
%	93·2	....		.....	.....	.....	.....	.....
. %	50·4	.		.....	.....	.....	.....	.....
. %	109·7			.....	.....	.....	.....	.....
%	0·0	......		.....	.....	.....	.....	.....
%	7·9			.....	.....	.....	.....	.....
%	5·3			.....	.....	.....	.....	.....
%	16·5	. .		.....	.....	.....	.....	.....
%	59·8	.....	.....	.....	.....	.....	.....	.....

and Comments.

are all substantially alike in their general characteristics. All are extremely friable and the
rds in the average product passes through the 2″ bar screens ordinarily used. The pure coal
e somewhat unusual characteristic of being poorer in quality than their own screenings.
able as well as the more profitable portion to coke.
ls require washing under present market conditions. They are, however, so constituted as
me more discriminating several of the mines will find it to their advantage to wash their pro-
ashing test on one sample, and No. 51 was chosen as higher in ash than any other producing
ns based on the specific gravity experiments

ne

SUMMARY I

Official number of the colliery as per ...

Proximate analysis, etc., of officia...
1. Moisture in the check sample seal
2. Volatile matter in main sample aft
3. Fixed carbon " " "
4. Ash " " ..
5. Sulphur " " ..
6. Calorific value of " "
7. Calorific value calculated to ash fr

Proximate analysis, etc., of combine
8. Volatile matter in washed coal afte
9. Fixed carbon " " "
10. Ash " " "
11. Sulphur " " "
12. Calorific value of " "
13. Calorific value calculated to ash fr
14. Ash in refuse from coal washing—

Experimental washing tests with hea
15. Clean coal of under 1,375. . .
16. " " " " " ....
17. Bony " " between 1,375 and
18. " " " " " "
19. Refuse of over 1,550... ... . .
20. " " " " ....
21. Useful coal, being combined clean
22. " " " " "

Summary statement of results of wa
23. Yield of washed coal—combined pr
24. Perfection of yield as compared wi
25. Reduction in ash due to washing..
26. Perfection ash reduction compared
27. Reduction in sulphur due to washi
28. Increase in calorific value due to w
29. " " boiler evaporation due
30. Yield of refuse from washing tests.
31. Decrease in clinker in boiler furnac

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25 = *No. 1 Mine, Canmore, H. McNeil Co.* T
however, contained a good deal of removable slat
but as it is non-coking it may not pay to wash it
23 = *Pea Size Bankhead Anthracite, Banf*
23 SP = *Buckwheat size Bankhead Anth*
23 M = *Mixture of equal parts of Pea and Bu*
This coal is an anthracite and the samples w
see whether the dry cleaned coal could be mater
duct than dry, but probably it will cost more an
24 = *Briquettes from Bankhead Coal.* These b
compressed in moulds. The sample was not wa

TABLE

SUMMARY RECORD OF COAL WASHIN

Official number of the colliery as per list on page 10, Vol. I, of report....

Proximate analysis, etc., of official samples
1. Moisture in the check sample sealed at mine..........
2. Volatile matter in main sample after drying..........
3. Fixed carbon " " " " " ....
4. Ash " " " " " ....
5. Sulphur " " " " " ....
6. Calorific value of " " " " ....
7. Calorific value calculated to ash free dry coal..........

Proximate analysis, etc., of combined product of large scale washing test
8. Volatile matter in washed coal after drying..........
9. Fixed carbon " " " " " ....
10. Ash " " " " " ....
11. Sulphur " " " " " ....
12. Calorific value of " " " " ....
13. Calorific value calculated to ash free dry washed coal..........
14. Ash in refuse from coal washing—after drying..........

Experimental washing tests with heavy solutions on fine crushed coal of
15. Clean coal of under 1,375..........
16. " " " " " ....
17. Bony " " between 1,375 and 1,550..........
18. " " " " " " " ....
19. Refuse of over 1,550..........
20. " " " " ....
21. Useful coal, being combined clean and bony..........
22. " " " " " " " ....

Summary statement of results of washing
23. Yield of washed coal—combined product all sizes..........
24. Perfection of yield as compared with heavy solution tests..........
25. Reduction in ash due to washing..........
26. Perfection ash reduction compared with heavy solution tests..........
27. Reduction in sulphur due to washing..........
28. Increase in calorific value due to washing..........
29. " " boiler evaporation due to washing..........
30. Yield of refuse from washing tests..........
31. Decrease in clinker in boiler furnace due to washing..........

Notes and Com

25 = *No. 1 Mine, Canmore, H. McNeil Co.* This sample was taken during the last days of however, contained a good deal of removable slate and bone, which thus raised the ash to a fair but as it is non-coking it may not pay to wash it under present market conditions.

23 = *Pea Size Bankhead Anthracite, Banff.* (Dry cleaned).

23 SP = *Buckwheat size Bankhead Anthracite, Banff.* (Dry cleaned).

23 M = *Mixture of equal parts of Pea and Buckwheat size.* (Dry cleaned).

This coal is an anthracite and the samples were taken from stocks of coal dry cleaned in a see whether the dry cleaned coal could be materially improved by wet treatment and the resul duct than dry, but probably it will cost more and it may involve heavier losses of fines.

24 = *Briquettes from Bankhead Coal.* These briquettes are produced from the dust which w compressed in moulds. The sample was not washed.

TABLE XVII.

WASHING TESTS, CASCADE COAL FIELD.

	Canmore-Bankhead Field				
...port	No. 25	No. 23	No.23 SP	No. 23 M	No. 24
....	1·2	1·0	1·1	....	2·7
.... %	17·2	11·8	12·6	12·6	17·1
.... %	70·5	76·0	71·5	73·3	68·6
.... %	12·3	12·2	15·9	14·1	14·3
.... %	0·8	0·6	0·6	0·6	0·6
.... Cal.	7340	7400	7040	7270	7280
.... Cal.	8370	8430	8370	8460	8490
...shing tests					
.... %	16·2	....	....	12·5	....
....	77·9	....	....	78·6	....
.... %	5·9	....	....	8·9	....
.... %	0·7	....	....	0·6	....
.... Cal.	8000	....	....	7760	....
.... Cal.	8500	....	....	8520	....
.... %	54·1	....	....	55·4	....
...ed coal of official samples					
.... yield %	74·5	....	....	58·0	....
.... ash %	2·1	....	....	2·7	....
.... yield %	9·5	....	....	21·0	....
.... ash %	13·2	....	....	17·2	....
.... yield %	16·0	....	....	21·0	....
.... ash %	50·6	....	....	46·0	....
.... yield %	84·0	....	....	79·0	....
.... ash %	3·7	....	....	6·0	....
.... %	91·5	....	....	84·0	....
.... %	97·0	....	....	106·2	....
.... %	52·0	....	....	36·9	....
.... %	62·7	....	....	67·4	....
.... %	12·5	....	....	00·0	....
.... %	9·0	....	....	6·7	....
.... %	13·1	....	....	14·1	....
.... %	17·2	....	....	13·7	....
.... %	43·2	....	....	36·7	....

...nd Comments.

...last days of a mine which [illegible] [illegible] ...uced an exceptionally high class fuel. The sample, ... ash to a fairly high am[illegible] [illegible] was washed and its quality very decidedly improved,

... cleaned in a "breaker" with [illegible] [illegible] automatic slate pickers. A washing test was run to ...nd the results are interesting [illegible] [illegible] ...edly wet treatment even alone will give a better pro... fines.

...ust which would be otherw[illegible] [illegible] Tar is added in proper proportions and the mass

SUMMARY RECO

Official number of the coll [illegible]
of report

Proximate analysis, etc., of [illegible]
1. Moisture in the check samp [illegible]
2. Volatile matter in [illegible]
3. Fixed carbon
4. Ash
5. Sulphur
6. Calorific value of
7. Calorific value calculated to ash [illegible]

Proximate analysis, etc., of comb [illegible]
scale washing tests
8. Volatile matter in washed coal [illegible]
9. Fixed carbon " "
10. Ash " "
11. Sulphur " " " "
12. Calorific value of " "
13. Calorific value calculated to ash free d
14. Ash in refuse from coal washing- aft

Experimental washing tests with [illegible]
fine crushed coal of official samp
15. Clean coal of under 1.375
16. " " " "
17. Bony " " between 1.375 and 1.55
18. " " " " " " "
19. Refuse of over 1,550
20. " " " "
21. Useful coal, being combined clean an
22. " " " " "

Summary statement of results of wash
23. Yield of washed coal—combined pro
24. Perfection of yield as compared wi
tests..........
25. Reduction in ash due to washing
26. Perfection ash reduction compa [illegible]
tion tests.......
27. Reduction in sulphur due to wash [illegible]
28. Increase in calorific value du [illegible]
29. " " boiler evaporation d [illegible]
30. Yield of refuse from washing [illegible]
31. Decrease in clinker in boil [illegible]

Ex 1 = No. 1 Granite Creek R.M.*
Ex 2 = No. 2 Granite Creek R.M.
Ex. 3 = No. 4 Granite Creek R.M.
These three samples of about 150 [illegible]
but the samples were from near the surfa [illegible]

22 = *No. 1 Colliery, Nicola V* [illegible]
22 SP = *No. 2 Colliery, N* [illegible]
22 M = *Mixture of 140 sacks of No. 1* [illegible]
These samples are very much alike [illegible]
conditions probably do not at present justify th [illegible]

Ex. 31 = Upper Seam, Tantalus M
Ex. 32 = Middle Seam, Tantalus Mine
Ex. 33 = Lower Seam, Tantalus Mine
These samples only weighed about 2 [illegible]
They show high ash but rather low sulphur [illegible]
than this can only be secured by [illegible]

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*R.M. = Run of mine.

TABLE XVIII

SUMMARY RECORD OF COAL WASHING TESTS, COAST RANGE COAL FIELDS.

		Granite Creek, B.C.			[illegible] B.C.			Whitehorse, Y.T.		
Official number of the colliery as per list on page 10, Vol. I, of report		Ex. No. 1	Ex. No. 2	[illegible]	[illegible]	No 22SP	No 22 M	Ex. No. 31	Ex. No. 32	Ex. No. 33
Proximate analysis, etc., of official samples										
1. Moisture in the check sample sealed at mine	%				[illegible]	[illegible]		......	......	
2. Volatile matter in main sample after drying	%	33·7	32·1	[illegible]	[illegible]	[illegible]	39·1	25·0	26·7	27·8
3. Fixed carbon " " " " "	%	54·0	53·6	[illegible]	[illegible]	[illegible]	46·8	58·0	54·1	56·0
4. Ash " " " " "	%	12·3	14·0	[illegible]	[illegible]	[illegible]	14·1	17·0	19·2	16·2
5. Sulphur " " " " "	%		1·9		[illegible]	[illegible]	0·9	0·5	0·5	0·5
6. Calorific value of " " " " "	Cal				[illegible]	[illegible]	6510	6700	6310	6790
7. Calorific value calculated to ash free dry coal	Cal					[illegible]	7580	8070	7810	8100
Proximate analysis, etc., of combined product of large scale washing tests										
8. Volatile matter in washed coal after drying	%	...					39·8	26·3	25·7	28·1
9. Fixed carbon " " " " "	%	....					50·2	59·9	60·8	59·2
10. Ash " " " " "	%	7·9	10·4	[illegible]			10·0	13·8	14·0	12·7
11. Sulphur " " " " "	%		1·8				0·9	0·5	0·4	0·5
12. Calorific value of " " " " "	Cal						7010	7110	7070	7210
13. Calorific value calculated to ash free dry washed coal	Cal						7790	8250	8220	8260
14. Ash in refuse from coal washing—after drying	%						45·8	43·5	45·8	50·1
Experimental washing tests with heavy solutions on fine crushed coal of official samples										
15. Clean coal of under 1,375 .... yield	%	84·0	77·9	65·9			74·5	38·0	23·0	53·0
16. " " " " " .... ash	%	5·9	6·2	7·3			6·1	4·5	5·2	5·3
17. Bony " " between 1,375 and 1,550 .... yield	%	7·5	12·1	[illegible]			16·5	40·0	50·5	24·7
18. " " " " " " " .... ash	%	25·0	24·8	23·6			23·6	14·2	14·7	15·3
19. Refuse of over 1,550 .... yield	%	8·5	10·0	12·0			9·0	22·0	26·5	22·3
20. " " " " .... ash	%	56·7	60·0	57·0			61·0	43·5	46·8	40·0
21. Useful coal, being combined clean and bony .... yield	%	91·5	90·0	[illegible]			91·0	78·0	73·5	77·7
22. " " " " " " " .... ash	%	8·2	8·8	[illegible]			9·2	9·5	11·7	8·5
Summary statement of results of washing										
23. Yield of washed coal—combined product all sizes	%	85·0	90·0				87·0	81·0	76·5	83·0
24. Perfection of yield as compared with heavy solution tests	%	92·9	100·0	[illegible]			95·7	103·8	104·0	106·8
25. Reduction in ash due to washing	%	35·7	25·7	[illegible]			29·1	18·8	27·1	21·6
26. Perfection ash reduction compared with heavy solution tests	%	103·8	84·6	[illegible]			92·0	68·8	83·5	66·9
27. Reduction in sulphur due to washing	%		5·3				6·0	0·0	20·0	00·0
28. Increase in calorific value due to washing	%						7·7	6·1	12·0	6·2
29. " " boiler evaporation due to washing	%						2·3	..	.	.....
30. Yield of refuse from washing tests	%						2·8	14·7	21·5	13·8
31. Decrease in clinker in boiler furnace due to washing	%						25·7		...	..

Notes and Comment

Granite Creek Field

Ex. 1 = No. 1 Granite Creek. (R.M.)*
Ex. 2 = No. 2 Granite Creek. (R.M.)
Ex. 3 = No. 4 Granite Creek. (R.M.)

These three samples of about 150 pounds each were from prospect tunnels in a new field [illegible] of fairly good quality and to wash rather well, but the samples were from near the surface and were small in quantity, and the property [illegible] before truly representative samples can be taken

[illegible]

22 = No. 1 Colliery, Nicola V. C. & C. Co. (R.M.)
22 SP = No. 2 Colliery, Nicola V. C. & C. Co. (R.M.)
22 M = Mixture of 140 sacks of No. 1 and 10 sacks No. 2 (R.M.)

These samples are very much alike. The mixture was washed with fairly good results [illegible] decidedly improved by treatment, but market conditions probably do not at present justify the erection of a washery

Whitehorse [illegible]

Ex. 31 = Upper Seam, Tantalus Mine.
Ex. 32 = Middle Seam, Tantalus Mine.
Ex. 33 = Lower Seam, Tantalus Mine.

These samples only weighed about 200 pounds each, but the mine had been more [illegible] and they are probably more representative. They show high ash but rather low sulphur. The specific gravity tests indicate fairly easy washing [illegible] carrying 13 per cent ash. Greater purity than this can only be secured by unduly increasing the amount of material wasted

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*R.M. = Run of mine.

SUMMARY RECORD

Official number of the colliery as per list o

Proximate analysis, etc., of official sa
1. Moisture in the check sample sealed
2. Volatile matter in main sample afte
3. Fixed carbon " " " "
4. Ash " " " "
5. Sulphur " " " "
6. Calorific value of " " "
7. Calorific value calculated to ash fre

Proximate analysis, etc., of combined
8. Volatile matter in washed coal afte
9. Fixed carbon " " " "
10. Ash " " " "
11. Sulphur " " " "
12. Calorific value of " " "
13. Calorific value calculated to ash fre
14. Ash in refuse from coal washing—a

Experimental washing tests with hea
official samples
15. Clean coal of under 1,375..........
16. " " " "
17. Bony " " between 1,375 and 1
18. " " " " " "
19. Refuse of over 1,550..............
20. " " " " ....
21. Useful coal, being combined clean a
22. " " " " "

Summary statement of results of wa
23. Yield of washed coal—combined pr
24. Perfection of yield as compared wit
25. Reduction in ash due to washing
26. Perfection ash reduction compared
27. Reduction in sulphur due to washin
28. Increase in calorific value due to wa
29. " " boiler evaporation due t
30. Yield of refuse from washing tests
31. Decrease in clinker in boiler furnac

20 = *Extension Mine, Wellington Colliery C*
be improved by treatment and would yield a fai
washing even now.

18 = *Upper South Nanaimo Seam, W. F. Co.,*
would be difficult to improve it very materially b

17 = *North Level Nanaimo Seam, W. F. Co.,* N
the specific gravity tests show that no great impr
to justify treatment.

21 = *Comox No.* 4, *W. C. Co.* (S. and P.)

21 *SP* = *Comox No.* 7, *W. C. Co.* (S. and P.

21 *M* = *Mixture of equal parts of the above* (
howed it to be more likely to be benefitted

Ex. 34 = *Suquash Mines, P.C. Coal Co.* Thi
The mine was in an early stage of development a
materially, but even better results could have be
as the mine goes deeper.

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*S = Screened coal. P = Hand picked to rem

TABLE

SUMMARY RECORD OF COAL WASHING T

Official number of the colliery as per list on page 11, Vol. I, of report.....

Proximate analysis, etc., of official samples

1. **Moisture** in the check sample sealed at mine..........
2. **Volatile matter** in main sample after drying..........
3. **Fixed carbon** " " " " "..........
4. **Ash** " " " " "..........
5. **Sulphur** " " " " "..........
6. **Calorific value** of " " " "..........
7. **Calorific value** calculated to ash free dry coal..........

Proximate analysis, etc., of combined product of large scale washing t

8. **Volatile matter** in washed coal after drying..........
9. **Fixed carbon** " " " " "..........
10. **Ash** " " " " "..........
11. **Sulphur** " " " " "..........
12. **Calorific value** of " " " "..........
13. **Calorific value** calculated to ash free dry washed coal..........
14. **Ash** in refuse from coal washing—after drying..........

Experimental washing tests with heavy solutions on fine crushed coal of official samples

15. **Clean coal** of under 1
16. " " " "..........yiel
17. **Bony** " " between 1,375 and 1,550..........as
18. " " " " " " "..........yiel
19. **Refuse** of over 1,550..........as
20. " " " "..........yiel
21. **Useful coal**, being combined clean and bony..........as
22. " " " " " " "..........yiel

..........as

Summary statement of results of washing

23. **Yield of washed coal**—combined product all sizes..........
24. **Perfection of yield** as compared with heavy solution tests..........
25. **Reduction in ash** due to washing..........
26. **Perfection ash reduction** compared with heavy solution tests..........
27. **Reduction in sulphur** due to washing..........
28. **Increase in calorific value** due to washing..........
29. " " boiler evaporation due to washing..........
30. **Yield of refuse** from washing tests..........
31. **Decrease in clinker** in boiler furnace due to washing..........

Notes and Co

Nanaimo-Com

20 = ***Extension Mine, Wellington Colliery Co.*** (S. and P.)* This coal does not requir
be improved by treatment and would yield a fairly large percentage of coal carrying abou
washing even now.

18 = ***Upper South Nanaimo Seam, W. F. Co., No. 1.*** (S. and P.) This coal does not r
would be difficult to improve it very materially by washing.

17 = ***North Level Nanaimo Seam, W. F. Co., No. 1.*** (S. and P.) This coal, like the ot
the specific gravity tests show that no great improvement could be effected owing to the hi
to justify treatment.

21 = ***Comox No. 4, W. C. Co.*** (S. and P.)

21 ***SP*** = ***Comox No. 7, W. C. Co.*** (S. and P.)

21 ***M*** = ***Mixture of equal parts of the above.*** (S. and P.) This sample does not need w
howed it to be more likely to be benefitted. It was, therefore, washed successfully.

Alert Bay F

Ex. 34 = ***Suquash Mines, P.C. Coal Co.*** This sample was provided by the owners fo
The mine was in an early stage of development and the sample was probably much dirtier
materially, but even better results could have been attained had the coal been crushed fin
as the mine goes deeper.

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*S = Screened coal. P = Hand picked to remove rubbish.

TABLE XIX

HING TESTS, VANCOUVER ISLAND COAL FIELDS.

			Nanaimo-Comox Field				AlertBay
port...........	No. 20	No. 18	No. 17	No. 21	No.21 SP	No. 21 M	Ex. No. 34
..............%	1·8	2·2	[illegible]	......	......	......	....
..............%	40·1	41·2	[illegible]	31·6	28·0	30·2	34·3
..............%	49·8	48·5	[illegible]	56·5	60·1	57·8	42·7
..............%	10·1	10·3	[illegible]	11·9	11·9	12·0	23·0
..............%	0·4	0·9	[illegible]	1·0	0·9	0·9	1·0
............Cal.	7310	7130	[illegible]	7150	7210	7230	6170
............Cal.	8130	7950	[illegible]	8120	8180	8220	8010
washing tests							
..............%			......	....	....	30·8	36·7
..............%			......	....	....	60·3	48·2
..............%			......	....	....	8·9	15·1
..............%			......	....	....	0·8	0·9
............Cal.			......	....	....	7550	6420
............Cal.			......	....	....	8290	7560
..............%			......	....	....	50·6	....
shed coal of							
........yield %	86·0	86·5	[illegible]	....	....	80·0	62·6
..........ash %	5·5	6·8	[illegible]	....	....	5·3	4·5
........yield %	6·0	10·0	[illegible]	....	....	13·0	13·9
..........ash %	22·7	20·0	[illegible]	....	....	21·7	23·7
........yield %	8·0	3·[illegible]	[illegible]	....	....	7·0	23·5
..........ash %	45·0	52·5	[illegible]	....	....	71·5	54·0
........yield %	92·0	96·5	[illegible]	....	....	93·0	76·5
..........ash %	6·5	8·2	[illegible]	....	....	7·6	8·0
..............%			......	....	....	87·5	80·6
..............%			......	....	....	94·2	106·0
..............%			......	....	....	25·8	34·3
s..........%			......	....	....	85·4	52·9
..............%			......	....	....	11·1	10·0
..............%			......	....	....	4·4	4·1
..............%			......	....	....	5·5	......
..............%			......	....	....	12·0	....
..............%			......	....	....	33·3	....

s and Comments.

anaimo-Comox Field.

es not require washing under present commercial conditions, but if necessary it could easily
arrying about 7 per cent ash and very low sulphur. The screenings might be the better for

al does not require washing under present conditions and the specific gravity tests show that it

l, like the others from the same district, does not require washing under present conditions, and
ing to the high innate ash. The sulphur could, however, probably be reduced, but not enough

s not need washing any more than the other coals of the district, but the specific gravity tests
uccessfully. The screenings would probably be even more improved by similar treatment.

Alert Bay Field

e owners for a private test, the results of which they very generously permit being published.
much dirtier than the commercial coal will be. Washing reduced the ash and sulphur very
n crushed finer. It is probable that much better results could be obtained in practice, especially

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